THE IRON AGE

THURSDAY, OCTOBER 11, 1888.

New Emery Grinders.

We illustrate on this page two new emery grinders built by the Norton Emery Wheel Company, of Worcester, Mass., the nature of the design being well shown and requiring little description. The machines are furnished with self-oiling boxes, which keep the bearings supplied with oil for a long time without refilling, and they are so arranged as to prevent dust from entering the journals. It will be noticed that the bearings are of extra length and that unusual distance is given between wheels. It is a well-known fact that the machinery for this purpose should be strong, firm and heavy, and this point has not been forgotten. Fig. 1 represents a 2-inch grinder, the distance between the wheels being 40 inches and the entire length of spindle 55 inches. The bearings are 12 inches long and the hight from floor to the center of the spindle is 29½ inches. The spindle, for slow speed, runs at 925 revolutions per minute, and of quick speed, at 1350. The weight of the machine complete is 1000 pounds. Fig. 2 shows a 1-inch bench grinder running at 1600 and 2250 turns per minute for slow and quick speed work respectively. The wheels here are 21¾ inches apart and the entire length of the spindle is 29 inches. The weight, including countershaft, is only 180 pounds. Both machines will work equally well wet or dry.

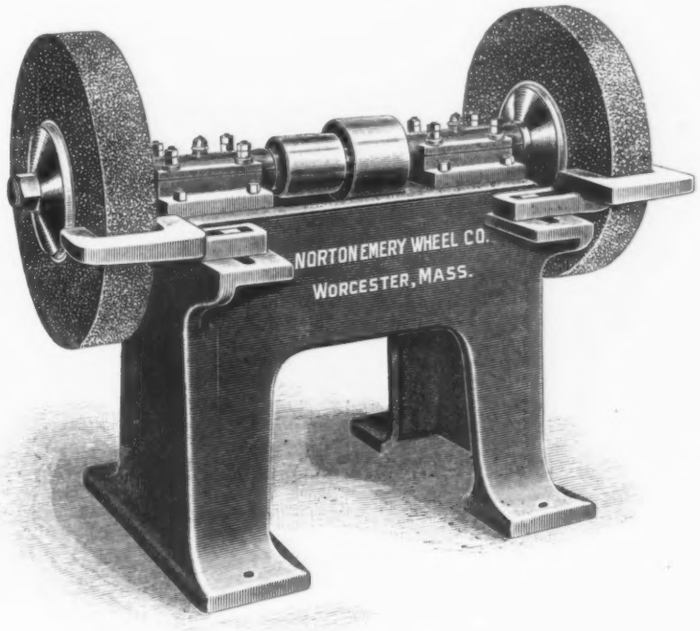


Fig. 1.—Two-Inch Standard Grinder.

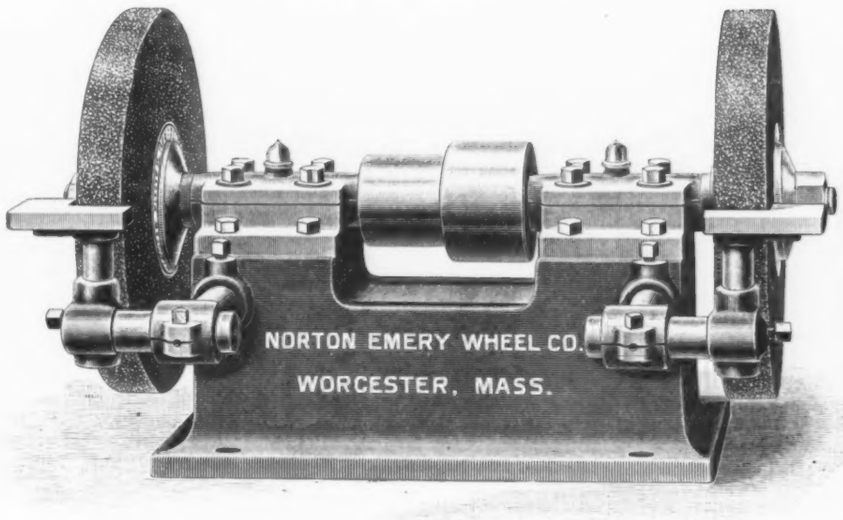


Fig. 2.—One-Inch Bench Grinder.

NEW EMERY GRINDING MACHINERY, BUILT BY THE NORTON EMERY WHEEL CO., WORCESTER, MASS.

Experiments in submarine telephony have been made by the French Government at Brest. The instrument is called a hydrophone, but is practically a microphone and was invented by M. Barraré. Under favoring conditions the sounds of bells, whistles and trumpets were heard for distances up to 5700 yards. In the case of a ship in motion, however, the experiments were not so successful, though the sounds were heard clearly at a distance of 1500 yards.

Minnesota Iron Ores.—II.

BY JOHN BIRKINBINE, PHILADELPHIA, PA.

The Tower Mine.

Two hundred feet is the present working depth of part of the Tower mines, but a shaft is sunk 70 feet further, from which drifts are being run so as to keep several years' work in sight. The large open pits are still operated, but all new work is underground. The policy which General Superintendent Bacon has adopted, of keeping so far in advance of actual mining, has somewhat increased the proportion of lean ores; but even this "Red Lake" ore, yielding 62 to 65 per cent. of iron, cannot be considered lean. The "Minnesota Bessemer" ore is fully up to the high standard of excellence adopted by the company. The season's average being reported as "67 per cent. strong." The complimentary names assigned to the various openings have given place to the shorter system of numbers, for diamond drill explorations indicate that the ore lenses overlap each other, and new openings will probably soon be necessary.

A most interesting study of the peculiarities of the occurrence of red hematite ore is found in the western end of the Ely pit, where over one-half of the ore body was cut out by a nearly perpendicular face of jasper, but deeper down the ore penetrated into the horse, and at a greater depth the ore-lense apparently divides and passes on either side, between the horse and the foot and hanging walls. Viewed from the opening, this horse resembles a nearly vertical pier, standing some distance from the foot wall, carrying an arch, which extends from it to the hanging wall, the arch being nearly a true half circle, seamed so as to closely resemble stone voussoirs. The ore was followed into this arch and gradually pinched out, so that the horse stops short of presenting the appearance of a natural bridge. The almost perpendicular face of the pillar, rising from the present workings over 100 feet to the level from which the surface drift was removed, and the arch which it supports presents a most impressive picture when the miners working at its base emphasize its size. The magnificent proportions of the open quarry, which has heretofore been known as the Tower Pit, make it fully as impressive as any other of our large open iron mines.

The Chandler Mine.

The extension of the Duluth and Iron Range Railroad from Tower north-eastwardly for 21 miles to Ely, has added to the shipping mines the "Chandler," and it is expected to contribute 40,000 tons or more of ore to Minnesota's output of probably 500,000 tons of iron ore in 1888.

While the character of the ore from the Chandler mine resembles that at the Tower mines, its physical condition and occurrence are quite different. The Chandler may be described as a *gravel bank* of hard specular ore, while the Tower mines are quarries of compact masses of hard specular ore. In occurrence the ore in the Chandler mine more nearly resembles some of the Gogebic mines, but the individual pieces are hard ore. As it now appears, the Chandler mine is an open pit, from which about 20 feet of drift has been stripped, and some 20 feet of loosely agglomerated ore is being taken by inclined skip roads. Two shafts, 750 feet apart, are sunk outside of the ore body, from these drifts are run and chutes or raises are being cut to take the ore out of the open pit below the present working level. These shafts are vertical, 82 and 92 feet from the surface, respectively, fitted with cages on which the tram-cars are run. The ore below the surface drift is very much broken and can be picked and shoveled readily. There is no close selection necessary, for the deposit is practically all clean ore. Cross cuts have shown the body to vary in width; the present workings measure at various cross cuts widths of 40 feet, 33 feet, 70 feet, and 108 feet, the latter being the widest part discovered; at the east end the indications do not promise such great width. While not comparable to the Tower mines, the Chandler is a magnificent deposit of Bessemer ore, the only drawbacks being that it is not held in fee, but is worked under a royalty of 50 cents per ton; and the broken condition of the ore which will make underground operations expensive. It is, however, the opinion of Captain Sellwood and Captain Pengilly that the ore will be harder and more compact as it is followed deeper into the earth. A full equipment of machinery is now being erected, and the owners anticipate that in 1889 the Chandler mine will rank among the large producers. The ore taken from the open workings is designated as "long lake," it carries 60 per cent. and over of iron, and is below the Bessemer limit of phosphorus; the "blue ore" at east end is claimed to average close to 67 per cent. of iron with 0.04 of phosphorus. As lake shipments have just commenced no cargo analyses are obtainable, but the following determinations which have been made will permit of liberal discount on account of selection and still indicate a superior ore.

Analyses of Ore from the Chandler Mine.

Iron	66.50	Personally selected for average of deposit.
Phosphorus	0.053	
Silica	2.62	

Iron.	Phosphorus.	Silica.	
69.07	0.019	....	
67.76	0.036	1.40	
69.00	0.018	0.82	drill core 150 feet deep.
66.79	0.036	4.07	drill core 150 feet deep.
68.73	0.050	1.13	80 feet deep large sampling.
66.23	0.058	2.60	

All analyses are made at 212° F., but the ore carries but little water.

The Chandler mine has large stock piles ready for shipment, some of which have accumulated on account of delays in getting the extension of the railroad from Tower to Ely in operation. The road-bed, which was made during the winter, passed over a "muskeg" or peat bog. When the frost left the bog the embankment disappeared; it was filled up and again sank, until, after repeated efforts, dumping two train loads of roots and timbers and 1500 carloads of gravel into a length of 150 feet of road-bed, a secure bottom was had. On either side of the railroad track are enormous furrows, as if cut by a gigantic plow, which show how the peat has been forced up by the filling settling to a bottom.

While explorations are not so active as a year ago, there is considerable life along the iron ranges, the diamond drill as well as pick, and dynamite being utilized. Some very favorable showings are reported, but outside of the mines now shipping, no others can be mentioned without doing injustice by omissions of some which may exhibit equally good indications. In making this statement, it is well to recall the high standard of excellence which characterizes the district. There is abundance of outcroppings pointing to ore considered lean in Minnesota, which in Pennsylvania, Virginia, Alabama and Tennessee would be ranked as merchantable. The seekers have invariably made Bessemer ore the desideratum, and any deposit which fails to meet the requirements of our steel works has disappointed the explorers. The establishment of industries at the head of Lake Superior will, however, have a tendency to bring some of these less desirable ores in demand.

The blast furnace of the Duluth Iron and Steel Company is sufficiently advanced to insure it going into operation next season, and the establishment of a carworks immediately adjoining the blast furnace will offer a market for considerable foundry iron, which will be supplemented by the requirements of the two foundries in Duluth and those of St. Paul and Minneapolis.

An industry once established at Duluth will expand, and the fact of ores being comparatively lean or carrying phosphorus beyond the Bessemer limit will not condemn them. The pipeworks, for which foundations are being laid in West Superior, Wis., show the faith of those interested in the supply of cheap foundry irons. Whether this company will follow the pipeworks with a blast furnace plant or depend at first upon the iron to be supplied by the Duluth Iron and Steel Company's furnace will be a question only for the initial operation, for other industries will surely follow. The project of a stove foundry at Duluth is now under consideration by some St. Louis parties. The problem of transporting coal to the head of Lake Superior and there coking it will soon be solved by practical tests in the battery of coke ovens constructed near the docks of the Lehigh Coal Company.

We may confidently expect that Minnesota will continue to be an important source of supply for high grade Bessemer iron ores, and also furnish a considerable amount of ores suited for foundry and mill irons. As but one-third of the pig-iron product of 1887 was of Bessemer grade the opportunities for utilizing non-Bessemer ores from Minnesota are encouraging, and the probabilities are favorable for the development of some of the leaner red hematites and the exploitation of some of the magnetites. The presence of titanium in the latter has discouraged operations along the Messabi range, but there are numerous analyses shown which exhibit little or none of this element. There is no reason to anticipate that the entire range will produce titaniferous magnetites, for in the Lake Champlain district we find titaniferous and non-titaniferous, Bessemer or non-Bessemer magnetites in deposits located close to each other.

Wages in the Pittsburgh Coal Field.—As was announced in these columns some time since, the wages of the railroad coal miners in Pennsylvania will be advanced 5 cents per ton on November 1, increasing the mining rate to 79 cents a ton, according to the agreement made last April. It was then decided by the operators and miners in joint session that the mining rate should be 74 cents from May 1 to November 1, and from the latter date to May next 79 cents. Some of the operators who were not represented at the joint convention, it is stated, will not pay the advance, and unless an amicable arrangement is made before November 1, it is probable that trouble will ensue, as the miners say they will enforce the advance.

Mahoning Valley Coke Rates.—Some time ago the iron manufacturers and blast-furnace operators of the Mahoning Valley, Ohio, through Robert Bentley, secretary of their organization, presented a petition to the managers of the various railroads asking that the rate on coke from the Connellsville region to the valley be reduced from $1.35 per ton to $1.25 per ton. An answer has been received, stating that at present the roads were overtaxed, cars were scarce, and they felt that they could not comply with the request. They promised not to advance the rate, and intimated that when business should slacken somewhat they might reconsider their decision.

Rolling Seamless Tubes.

A subject which more recently has attracted a good deal of attention, both in England and Germany, is the rolling of seamless tubes from solid bars or ingots by what is known as the Mannesmann process. At the late meeting of the British Association Mr. Frederick Siemens presented a paper describing it in detail, and from this we take the following, together with the engravings:

The process consists generally in a method of rolling metal into seamless tubes, and it will contribute greatly to increase the use of steel, and principally of those kinds of cheap steel produced by the methods mentioned above. The open-hearth or Siemens steel, above all, possesses the advantage of being cheap, of having the right amount of toughness, homogeneousness and other qualities which fit it for the special purpose of rolling solid ingots direct into tubes. Tubes occupy an important place in the wants of mankind. Besides their use as tubes properly so-called they possess, also, the most advantageous form for columns, rods, axles, bearers, struts, &c. A given quantity of material can be formed into no shape so strong as the tubular.

Hitherto steel tubes could only be made with difficulty and at high cost by a complicated process with imperfectly welded seams and a longitudinal fiber. Now from a rough ingot of cheap steel with one or, at the most, two operations, a perfect tube without seam and with a circular fiber is produced. It may be seen from this bare statement how great is the importance of this invention. If it is considered that by the process in question tubes of great length and diameter, and of almost any desired thickness of metal, can be produced at a comparatively low cost, air-tight and possessing treble or quadruple the resisting power of the best welded tubes of wrought iron, it can hardly be doubted that a great future is opened out for their use in technical arts, industries, architecture, and also in war materials. New branches of industry may also be expected to arise, as we now have the means of bringing into use the best of material in the lightest and at the same time strongest form.

At the present time, to roll a bar of iron, two horizontal rolls, as shown in Figs. 1 and 2, revolving in opposite directions, are used. If the section of the finished bar is required to be of any given form, grooves are cut around the rolls of the sectional form which the bar is required to assume. Passed longitudinally between the revolving rolls the bar is forced into the grooves and reappears molded to the desired form. The rolls do not make the bar revolve, they act simply on its surface drawing the material forward and forcing it into the prepared grooves, at the same time elongate it and reduce its sectional area. The fiber produced in the finished product is of course longitudinal. Tubes are also made in this way. The prepared sheet of wrought iron is bent till the sides overlap and the longitudinal seam thus made is welded while passing through the rolls on a mandrel placed inside. The ordinary patent welded wrought-iron tubes made in this way have also a longitudinal fiber.

Another way (Figs. 3 and 4) of rolling is known and is used for straightening and polishing bars to which a rotating motion is imparted by two or three rolls revolving in the same direction. These rolls are for the most part placed parallel to one another, and the bar to be operated on is introduced in the direction of their longitudinal axis—that is, at the ends instead of at a right angle to the rolls. In such rolls the bar is not drawn forward but simply rotates, and if sufficient pressure is given the bar is elongated, but no decided fiber is produced.

Between the two kinds of rolling described above, which may for convenience be called longitudinal and circular respectively, another system of polishing and straightening bars and tubes occupies a kind of middle position. So also does the Mannesmann tube-rolling process. The systems differ, however; the first acts on the surface only of the bar or finished tube, whereas the latter actually makes the tube, and, in making it, displaces the material of the bar or ingot acted on, and imparts to it a fiber running in a spiral around it. In both systems two or three rolls may be used together, turning in the same direction, and, consequently, imparting a rotating movement in the opposite direction to a bar laid between them. The two or more rolls (Figs. 5 and 6), however, do not lie normally, nor even parallel, but at angles to the axis of each other, and the axis of these rolls cross one another and that of the bar, forming somewhere in space acute angles in opposite directions with each other, and with the bar lying between them. When thus set the rolls act on the bar to draw it forward as well as to make it revolve—or, in other words, they impart to it a spiral movement. Though constructively both systems of mills may appear much the same, they differ widely in their mode of working and in their results. This arises from the position which the article acted upon and which we will continue to call a bar, is made to take up, and the very different action and form of the rolls. In the Mannesmann machine a certain relation is maintained between the forward movement of the bar and its rotating movement, and if the proportion between longitudinal and rotary motion is properly adjusted to the special material acted on, the displacement in the substance of the bar is regulated so that a systematic twist is given to the fiber, by which not only irregular breakage of the material is avoided, but an energetic working action is secured, causing the great strength and toughness the tubes produced by this process are proved to possess.

The old straightening and polishing machine, although outwardly similar to the Mannesmann tube-rolling machine, owing to the form and position of the rolls and bars, admits of no twisting and displacement of material, and, consequently, this machine confines itself to surface action as, indeed, it professes to do by its title. The following remarks may assist in clearing up this singular difference, and explain

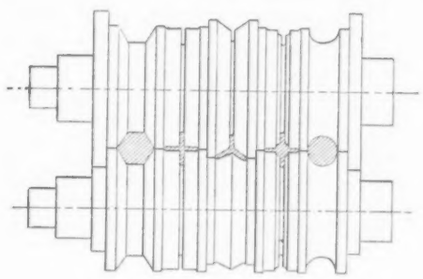


Fig. 1.

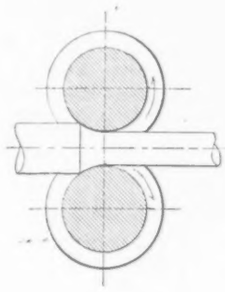


Fig. 2.

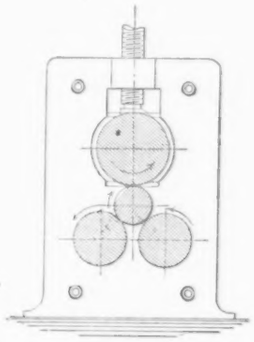


Fig. 3.

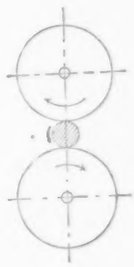


Fig. 4.

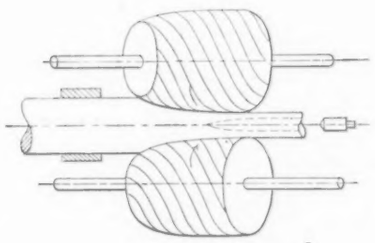


Fig. 5.

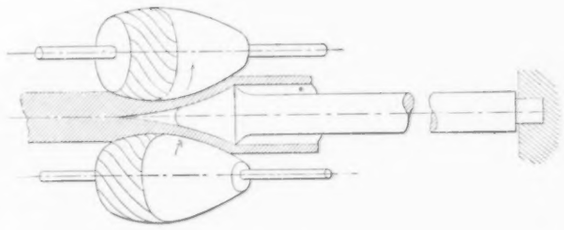


Fig. 6.

ROLLING SEAMLESS TUBES BY THE MANNESMANN PROCESS.

the peculiar action of the Mannesmann roll which, while acting on the outer surface of a solid bar, produce a regular hollow space inside the same—in short, a tube. To obtain a simple forward spiral action of the bar, the length of the rolls is immaterial; it will take place when the rolls are reduced to the form of thin disks. Supposing the disks to be infinitely thin, or what is the same thing, that their outer edges are reduced to a mathematical line and no sliding motion takes place, the bar must still move forward spirally, its spiral velocity being equal to the velocity of the outer circumference of the disks. If, instead of one pair of such thin disks, several pairs of disks of regularly increasing diameters are made to revolve on the same axis, the outer circumference of each disk will revolve with greater velocity than that of the preceding one. The same bar is, however, drawn forward through the several pairs of disk, and thus as each part of the bar enters successively a more advanced pairs of disks, the velocity with which that portion of the bar rotates increases, and it is drawn forward by each succeeding pair of disks as they catch hold of it with ever-increasing speed.

It will be understood that a bar passing through such a series of disks, no slipping being possible, the material of which it is composed cannot retain its original area or volume. The diameter of the bar being regulated by the disks, while simultaneously a violent stretching action is carried on, the material required can only be drawn from the inside of the bar, and thus a hollow space is formed. Instead of this peculiar arrangement of disks a conical or rather conoidal, pair of rolls, which amount to the same thing as the disks, considered as joined together, may be provided. It follows that a bar or rod of suitable dimensions which is passed through the Mannesmann rolls will, provided its substance is sufficiently homogeneous and plastic, undergo a violent twisting and stretching action, the fiber being spun as is the fiber in a rope on account of which the process may appropriately be called a a tortional process. The bar in its passage through the rolls is twisted as thread is twisted in a spinning machine. As, however, it cannot be fed from the outside as is the thread, and as has been said, the diameter cannot be reduced on acr count of the action of the rolls, it is forced to draw on the interior for a supply of material.

I will attempt to explain in another way. The tube is made thus: A bar is placed between the conoidal rolls at the part where their diameter being least the speed at which they move to make a revolution is also least. The rolls seize the bar and draw it into contact with parts of the cones which move more and more rapidly, though, owing to the way in which the rolls are set, the space left between them for the passage of the bar decreases slightly. Slight, however, as is this decrease in the space between the rolls a certain amount of material has to be shifted. The action of the rolls prevents this material from being taken from the outside of the bar, and consequently it is drawn from the interior—hence the hollow, hence the tube. Soon after entering the rolls a small central fracture is formed, which widens out to a hollow space as the increased stretch is made to take effect in an increased twist acted on from the surface. The increasing twist of the fiber of the bar while passing through the rolls and the peculiar relation kept up between longitudinal and turning action is the characteristic of the Mannesmann tube-rolling machine, and this action it is that enables it to make a tube from a solid bar or ingot. Though the bar is thus converted into a tube by the action of the rolls, and their action only, a mandrel is generally used to finish and smooth the interior and enlarge the tube. This use of the mandrel has led to the erroneous belief that it is necessary to form the hole in the bar. No machine, however, could stand the strain if it were attempted to force a mandrel longitudinally through a solid bar of hot steel. Such an operation is impossible. Just sufficient power is used to form the hollow in the bar from the action of the rolls on its outside, and into this hollow the mandrel enters, smooths the inside, and, when required, enlarges the tube. Thus we have the strange experience in rolling that, by one operation, the bar is made hollow and also longer and wider than when it entered the rolls a few seconds before. In a specimen placed before you is the proof that the hollow in the interior of the bar is formed without the intervention of a mandrel. This piece in its present shape is obtained by interrupting the action of the rolls while the bar is still on its way through them, and then breaking off the bar so as to expose that part where the hollow is just commencing to form. This piece is sound in its solid part, as well as in the hollow part, and the inner surface of the commencing tube is crystalline. This shows that no mandrel can have acted on it. Besides this, the inner surface is not oxidized as it would have been if it had been exposed to the air at a red or white heat. The bright surface is preserved because no air need enter the tube during formation. Until such a specimen as you have before you is cut open a vacuum exists in the interior, both ends being hermetically closed. Such a specimen is made by slightly pointing the bar at the two ends, so that they escape the full action of the rolls at its entry and exit.

This curious result can always be obtained, and it quite disposes of the allegations that the whole is made by a mandrel. The specimen shows also both how the tube in the center commences by a fracture of the metal and widens out, and also the twist of the fibre is seen which has the appearance of a rope. This peculiar twist of the fibre assists in giving the tubes their great toughness and resisting power. The various specimens put before you are mostly produced from the relatively cheap open-hearth steel. The Mannesmann process in shaping metals upsets most of the hitherto accepted ideas and conditions, inasmuch as, instead of avoiding any twist of the fibers, it by one operation gives the greatest possible twist to the fiber with a corresponding stretch of material. It moreover, as I have already said, may, assisted by a mandrel, increase the outer diameter of a bar instead of diminishing it, as do all other rolling mills. The tube produced by the Mannesmann process is generally greater in diameter than the bar from which it is formed.

The child is at its birth larger than the parent. From this description and the facts here attempted to be given, it is evident that we have in the Mannesmann process a system of rolling as new as it is capable of producing effects hitherto not contemplated. In combining all the various systems of rolling, as described above, it may claim to be called the universal system of rolling, in which all hitherto known rolling processes represent a part. The old polishing and straightening machine could never, it is evident, produce like results, because the essential constructive conditions are wanting. It is remarkable that not only competitors, but otherwise competent men, rejected the Mannesmann process as either not new, or as being wrong in principle and generally impracticable, and this sweeping condemnation was supported by arguments apparently logical and sound. I trust this short explanation of an intricate and novel process, and I may say principle, of rolling tubes from solid ingots may assist in dispelling the incredulity and prejudice that has grown up around it.

A New Cane Mill.

Messrs. Krajewski & Pesant, proprietors of the Erie Basin Iron Works, at Brooklyn, N. Y., have just completed and ready for shipment an improved form of cane mill which, aside from novelty of design, is remarkable for the fact that it is probably the largest piece of machinery of this kind that has ever been turned out.

The mill was built for the estate San Ramon, Cuba, and, unlike the ordinary forms having simply two crusher rolls, it has four rolls, two of them being what are termed cutter rolls for breaking up the cane before it passes to the crusher rolls proper. These cutter rolls are about 28 inches in diameter and 7 feet long, and consist of steel rings with suitable cutter projections slipped over wrought-iron shafts. The cane in passing through them is thoroughly broken up, and yields about one-half its juice. It is then fed through the crusher rolls, which also measure 7 feet in length, but are 6 feet 6 inches in diameter, and which extract the remaining juice, all of which falls into a large pan underneath, and can there be drawn off. By means of a pressure regulating device a pressure ranging up to 1000 tons can be brought on the rolls. Power for driving these is supplied by a 250 horse-power engine of the plain slide-valve type, the exhaust being used for heating the vacuum pans. Some idea of the size of the mill can perhaps be formed when we state that with engine and gearing complete it weighs over 300 tons. By means of the cutter rolls, which constitute the principal feature of the mill, a large increase is secured in the proportion of juice obtained as compared with the delivery of the ordinary two-roll crusher mill, and Mr. Krajewski tells us that they are now furnishing independent cutter-roll attachments to be used in connection with the older type mills. In this way the advantages of increased juice production can readily be secured without putting down an entirely new crushing plant.

Combined Engine and Boiler.—Mr. F. J. Curtis, of Spencerport, N. Y., is putting on the market a combined engine and boiler, which in many respects will be found convenient for small power users. The engine is made either automatic or of the throttling type, as may be desired, and is rated at three horse-power. The cylinder is 3½ inches in diameter by 4½-inch stroke. The bearings are made to take up wear, and the cross head is provided with adjustable brasses. Boiler and engine are on one base, making a compact and simple outfit. The boiler feed pump is inside the frame.

In our description of the Wheeling Steel Works in *The Iron Age* of October 4 a few errors were committed which require correction. The works were built by the three companies now operating them—namely, the Benwood Iron Works, the Belmont Nail Works and the Wheeling Iron and Nail Works—to manufacture steel for their own use and for the general market. The maximum output has been 450 tons per day and a weekly product of 2200 tons of finished material. The blooming mill is a 36-inch reversing mill built by Mackintosh & Hemphill, driven by a 40 x 48-inch engine constructed by the Southwalk Foundry and Machine Company. The capacity of the shear is to cut an 8 x 15-inch hot section. The E. P. Allis blowing engines are double, having 36-inch steam and 48-inch blast cylinders, of 5-foot stroke. The engine is of special design, the power being transmitted through rocking disks on principal shafts, with a fly-wheel on a countershaft rotated by direct connection with the disks.

Iron Ores and Coals on the South Atlantic and Ohio Railroad.

The control of the South Atlantic and Ohio Road, which extends from Bristol, Tenn., northwest about 40 miles, and which is to be extended to Big Stone Gap, on the line between Virginia and Kentucky, has passed into the hands of Dr. J. M. Bailey, president of the Bailey Construction Company, who has bought all the stock and bonds, and about 30,000 acres of mineral and coal lands lying contiguous to the line of the proposed extension, together with 1000 acres of town lots in Bristol, Tenn., and a similar quantity in Elizabethton, about 20 miles south on the Watauga River in the magnetic ore regions. These purchases aggregate $1,200,000, and Dr. Bailey has also bought out the interests of the Virginia, Tennessee and Carolina Steel and Iron Company in this region. The money has been provided for the building of the road to Big Stone Gap. The Louisville and Nashville is to extend its Cumberland Valley branch from Pineville to Big Stone Gap, where connection will be made with this road. Arrangements are completed for the erection of a large furnace, with 160 tons daily capacity, at Bristol. The plan proposes two furnaces of that size and a rolling mill. State geologist, John R. Proctor, of Kentucky, has made the following report on the iron and coal fields along the line of the road:

Coals.—Big Stone Gap is one of the natural passes leading from the South Appalachian coal field to the great coalless area stretching from southwestward to the Atlantic Ocean. Immediately north of the Gap the coal measures have a very great thickness above drainage, and there are found a number of thick coals, some of exceptional excellence. One coal has a thickness over a large area immediately tributary to the Gap of from 6 to 8 feet of coal, is most advantageously located for cheap mining, and is a superior coke, having from 93 to 95 per cent. of fixed carbon, with from 3 to 5 per cent. ash, and very low in sulphur. In addition to this very superior coking coal are cannel, splint and excellent gas coals. In Powell's mountain there is a southern extension of this field where three coals are present. An excellent coke has been made from one of these coals. Your company owns the most valuable portion of this outlaying coal field. These coals are the more valuable because of the proximity of the iron ores along the line of your road and because they are the nearest coal to the great deposits of high grade Bessemer steel ores in East Tennessee and western North Carolina, and they are of especial value to the South Atlantic and Ohio Railroad because that road has secured the shortest and most available route for the bringing together these cokes and steel-making ores.

Iron Ores.—The red fossil or Clinton iron ore is parallel and immediately along the line of the railway for a distance of 14 miles. This ore is a reliable stratified ore, and three beds are known to be present, one ranging from 30° to 65° thick of excellent soft ore, averaging from a large number of analyses from 45 per cent. to 54 per cent. of metallic iron, another ranging from 18° to 24° thick. This ore can be mined at low cost, say from 50 cents to $1 per ton, and I think it safe to assume that you have on the line of the S. O. & O. R. R. 20,000,000 tons of this ore that can be put upon the cars at the above named rate. This will give a freightage of 1000 tons a day for 54 years. Recently a new ore horizon has been developed from Big Stone Gap along the line of the road parallel to the above mentioned, and again along the Southern base of Clinch Mount. This is a limonite or brown ore, and is a reliable and extensive deposit. It is in the Oriskany of the upper Silurian. I superintended the openings made in this ore at a number of places along the line of the road, enough to convince me that there is a deposit of very fine limonite ore exceeding in quantity the Clinton or red fossil ore above referred to. At one point where several openings were made, I was convinced that, along a line of 3500 feet, 780,000 tons of ore can be had above drainage. This ore will yield from 50 per cent. to 55 per cent. of iron, and is low in silica and phosphorus. There is enough of this ore immediately along the line of the road to furnish freight sufficient for a long time to pay a large interest upon the cost of the road. At Clifton Forge District in West Virginia, where this same ore has been developed, the furnaces and industries developed by it furnish one-eleventh of all the freight of the Chesapeake and Ohio Railroad, and the ore there is 90 miles from a coking coal.

In addition to the above, ores are found near to the line of the road: 1, masses in the Trenton and Knox limestones and shales of the lower Silurian. Rich ores, with, in one instance, low enough phosphorus for Bessemer pig; 2, pockets of ore in Medina sandstone near top of Clinch Mountain; 3, stratified ore 2 feet thick in Chemung Shales. Immediately beyond (southeast) Bristol, and only from two to seven miles distant, are large deposits of semi-magnetic ores, with from 55 per cent. to 60 per cent. iron and very low in phosphorus. I will not dwell here on the immense deposits of limonite ores on the waters of the Watauga, and the specular and magnetic ores, nor on the large deposits of manganese, although these great deposits must in large measure be smelted by the coke from Big Stone Gap and Stock Creek, and thus furnish an immense freightage to the S. A. and O. R. R. The Norfolk and Western extended a branch road to the Cripple Creek ores on the south and to the coal on the north, and developed a mineral freightage of 48,311 tons in 1882 to 1,417,549 tons in 1887. The S. A. and O. will penetrate a coal field equal if not superior, and passes through deposits of ore more abundant and superior in quality to anything yet reached by the N. & W., and there is no reason why the freightage of the S. A. & O. may not be developed to the utmost capacity of the road.

I wish to call attention to the great advantage possessed by your road in the manner in which it secures great natural passes through the mountains. There are seven ranges of mountains running northeast and southwest, opposing almost impassable barriers to the construction of railways except by the route secured by this road. Some of the most successful manufacturers of iron and steel in Pennsylvania have made large investments along the line of the S. A. & O. R. R., intending to develop their properties as soon as the road reaches the coking coals. This insures a heavy permanent traffic to the road. The extension of roads now in progress of construction both to the southeast of Bristol and to the northeast and northwest of Big Stone Gap will make the S. A. & O. R R. an important and indispensable link connecting the Great Ohio Valley with the South Atlantic Seaboard. I know of no road with a greater combination of advantages: Coals, iron ores of exceptional excellence, and in the greatest abundance, timber and building stone, fertile soils, and the certainty of favorable connections with important railways at both termini.

The product of the Calumet and Hecla mine for the month of September was the largest it has ever made, amounting to 3084 tons, 1305 pounds. Its product for the week ending Monday, October 1, was also the largest ever made in one week, amounting to 789 tons, 135 pounds. Lately the mine made its best record for one day, the profit on the yield of 24 hours' work being estimated at $18,000.

Pittsburgh Freight Rates Eastward.—At a meeting of the Pittsburgh Committee of Freight Agents, held in that city on Friday, the 5th inst, new rates were made to all points East. This was done to make the tariff conform with the through rates from Chicago to New York, which go into effect on the 15th inst. The rates from Pittsburgh and all Pittsburgh group points are: To New York, first-class, 45 cents; second, 39 cents; third, 30 cents; fourth, 21 cents; fifth, 18 cents; sixth, 15 cents. Iron and steel less than carloads, 19 cents, and carloads, 16 cents per 100 pounds. Pig iron, in carload lots, $2.40 per gross ton. To Philadelphia, 39 cents, 33 cents, 28 cents, 19 cents, 16 cents, 13 cents, 14 cents, 11 cents and $2. To Boston, 51 cents, 45 cents, 33 cents, 24 cents, 21 cents, 18 cents, 19 cents and 16 cents. To Baltimore, 37 cents, 31 cents, 27 cents, 18 cents, 15 cents, 12 cents, 13 cents and 10 cents and $1.80.

Shrinkage Allowance for Tires.—Breakages of tires on railways may, to some extent, be accounted for by the fact that many tires are put on with too great an allowance for shrinkage. This keeps the tire in severe tension all the time and is a constant source of danger. There is every reason to believe that the allowances established about a year ago by the Master Mechanics' Association are about right, and it may, therefore, not be without interest to give them here. They are for inside diameters of tire:

38 inches less 0.040 inch.	56 inches less 0.060 inch.
44 inches less 0.047 inch.	62 inches less 0.066 inch.
50 inches less 0 053 inch.	66 inches less 0.070 inch.

Judge Andrews, of the Supreme Court in this city, has decided in favor of the application of the Elevated Railroad Companies for the appointment of Commissioners to assess the value of the easement which they require in operating their lines in front of private property. He became satisfied that all efforts of the petitioners to purchase real estate, in cases where suits are pending, would be fruitless on account of the impossibility of agreeing upon a "reasonable" valuation. Therefore, each of the parties may nominate a commissioner, and a third will be appointed by the court to act in all the proceedings.

The question has been asked, and last year was submitted to a committee of the Master Mechanics' Association, how big should a locomotive boiler be? The committee submitted their answer in a report to the last convention of the association, and the rule given in that report for calculating the heating surface of a locomotive boiler for engines with cylinders of 24-inch stroke was that the area of one piston in square inches should be multiplied by 5.8 and the product would be the total heating surface in square feet.

The suit of I. Townsend Burden against James A. Burden and the Burden Iron Company which was being heard before Justice Parker in the Circuit Court at Troy, N. Y., has been postponed till November 15.

It is reported that the Kishpaugh mines, in Warren County, N. J., have suspended operations. They were owned and operated by Pardee & Co. A shaft has been sunk to the depth of 500 feet, and the vein is found to be exhausted.

Our Population in 1890.

The census of 1890, preparations for which are already being made, promises to show in the United States a population of more than 70,000,000. The population in 1880, according to the census of that year, was 50,155,783 persons, of whom 43,475,840 were native, and 6,679,943 foreign-born. The natives had increased 10,484,698 from the figures of 1870—32,991,142—or 31.5 per cent. The foreign element had gained more slowly, however, bringing the percentage for the entire population down to 30 per cent. The same rate of increase applied to the census of 1880 will, according to the Philadelphia *Record*, give an increase of 15,046,639 persons during ten years ending in 1890.

The immigration between 1870 and 1880 was comparatively light, only 1,112,714 persons having come to this country during that decade. For the past few years, however, it has been unprecedented. The immigration since the last census has been as follows :

1880.....	457,257	1886.....	334,203
1881.....	669,431	1887.....	490,109
1882.....	788,992	1888 (8 months)	380,000
1883.....	603,322		
1884.....	518,592		4,637,252
1885.....	395,346		
Estimate for 2 years and 4 months....			1,100,000
Total for 10 years.....			5,737,252

Add this total to the increase in the native-born population at the rate which prevailed from 1870 to 1880, and it will be found that the probable increase in population during the present decade, after making due allowances for births and deaths, will have been 20,246,639, and the total population in 1890, native and foreign-born, 70,322,479, divided as follows :

Native.....	32,991,142	43,475,840	58,522,479
Foreign-born...	5,567,229	6,679,943	11,800,000
Total.....	38,558,371	50,155,783	70,322,479

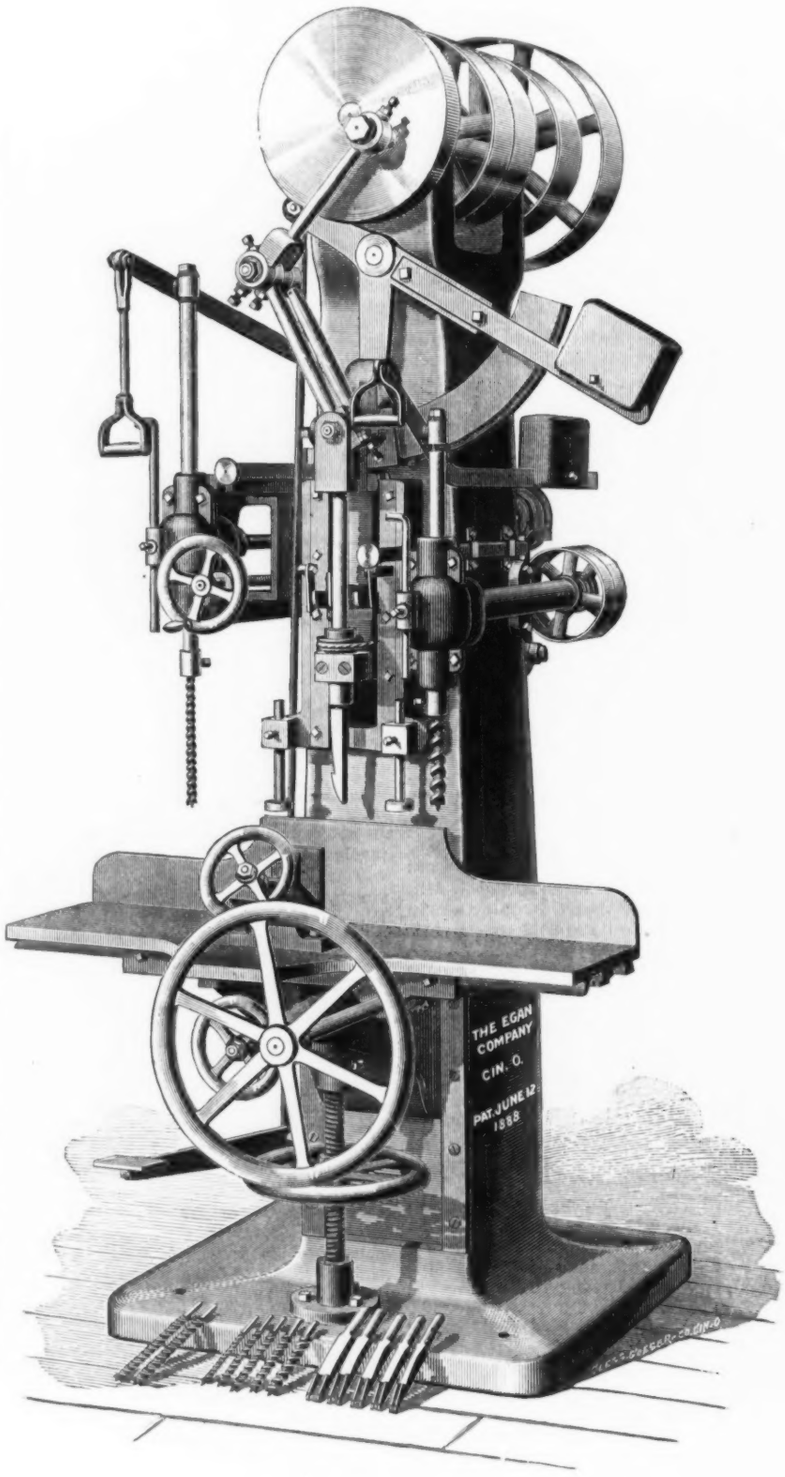
It is very evident that the foreign element will form a much larger proportion of the population in 1890 than ever before. In 1860 this proportion was about 13 per cent.; in 1870, 14 per cent., and in 1880, about 15 per cent. In 1890 it will not be not far from 18 per cent.

New Car Mortiser and Borer.

We illustrate on this page a new car mortiser, built by the Egan Company, 179 to 199 West Front street, Cincinnati, Ohio. It is a very heavy and substantial machine, designed to cut any size mortise from ¼ to 3 inches wide and 6 inches deep in all kinds of wood.

The column is one casting, and, being hollow, makes it amply strong enough to stand up to the heaviest strain to which a machine of this kind may be put. The tight and loose pulleys are placed on the fly-wheel shaft to run between bearings, thus equalizing the strain of the belt and keeping the shaft in line. All the working parts are planed perfectly true, and are accurately fitted and gibbed, which allows the machine to cut a perfectly straight mortise. The chisel mandrel is large in diameter, and is made of the best cast steel. It is connected to a solid ram working in planed ways, making it impossible for the mandrel to spring when mortising the hardest kind of wood at the full stroke. The chisel-reverser is entirely new and perfectly automatic. It is controlled by the treadle movement operating upon the chisel mandrel, and reversing the chisel every time the treadle is brought to the up-stroke. All other car mortisers with a graduating stroke are reversed by hand. The radial slide is entirely new, and is covered by letters patent. It is attached to the connections and operated by the treadle, and prevents the slightest jar on the foot, even when mortising without first boring a hole to admit the chisel, which, it is claimed, has never been accomplished heretofore on a machine of this class. The bed is very large, and is raised and lowered by a right and left hand screw, placed vertically between the bottom of the bed and the base of the column. It has a lateral movement of 4 feet, and a cross movement for mortising of 16-inch timbers.

There are two boring mandrels. One is in line with the chisel, and is intended to bore the hole for the chisel to start to work in. The auxiliary mandrel has a 16-inch stroke, and may be moved by a hand-wheel and screw to bore at any point within the width of the bed, which is 18 inches. Each boring mandrel is driven by a pulley on the machine, making the machine complete and self-contained.



CAR MORTISING AND BORING MACHINE, BUILT BY THE EGAN CO., CINCINNATI, OHIO.

Each machine is furnished with seven chisels, ½, ⅝, ¾, ⅞, 1, 1¼ and 1½ inch, with augers to match; also with three boring bits for the auxiliary boring mandrel, $\frac{9}{16}$, $1\frac{1}{16}$ and $1\frac{3}{16}$ inch. One of these mortisers was recently shipped to the American Refrigerator Transit Company, St. Louis, Mo., for use in their car shops, where it is doing good work.

THE MINING ENGINEERS

MEETING AT BUFFALO.

The 52d meeting of the American Institute of Mining Engineers was held in Buffalo last week, the members gathering for the opening session on Wednesday evening in the rooms of the Society of Natural Science, an address of welcome being delivered by Dr. Julius Pohlman, which was responded to by Prof. William B. Potter, of the Washington University, St. Louis, president of the Institute. The latter delivered an address dealing largely with the necessity of supplementing theoretical instruction with training in practical work. Dr R. W. Raymond presented a brief paper on "A Gold Breastplate from Central America," found by miners who were digging the foundation for a stamp mill at the Great Remance quartz mine, 15 miles from Santiago, United States of Colombia.

Wednesday morning the members were taken by a special train on the Western New York and Philadelphia Railroad to Dunkirk, where they visited the Brooks Locomotive Works, and were entertained subsequently. The evening session was opened by a paper read by F. V. Greene, formerly in charge of Government work at Washington, and now Vice-President of the Barber Asphalt Paving Company.

ASPHALT AND ITS USES.

He reviews briefly the characteristics of hydraulic and bituminous cements, the solid native mineral pitch or hard bitumen found in nature being what is known as asphalt. By far the most important, commercially, are the combinations of bitumen with quartz or limestone. Among the former are the bituminous sandstones and sands of France, which contain from 5 to 15 per cent. of bitumen mixed with sand and a small amount of limestone and clay. They are used for the extraction of bitumen, the process consisting of boiling in water at a temperature which fuses the bitumen and allows the sand to settle. The greater portion of this supply has now been exhausted. The bituminous sandstones of California have been used lately to supply the material for paving in Los Angeles and other cities on the Pacific coast, the reports of the quality being conflicting.

The bitumen limestones of France, at Seysell and Val-de-Travers contain about 10 to 11 per cent. of bitumen and have furnished the material with which portions of the streets of Paris and other cities are paved, Paris having about 13 miles, London 15 miles, Berlin 9 miles, and other cities 10 miles. Their main drawback has been the tendency to polish under traffic, which has made the pavement slippery. For sidewalks in Paris and elsewhere a preparation known as "asphalt mastic" is used. The powdered rock is mixed with 8 per cent. of molten Trinidad asphalt cooked for five hours at 280° F., and run into molds weighing about 50 pounds, in which form the mastic is sold. In use 60 parts of broken mastic is mixed with 4 parts of Trinidad asphalt and 36 parts of fine gravel and sand cooked for about two hours at 300° F., stirred and poured on the prepared foundation of the sidewalk. The aggregate length of these sidewalks in Paris is about 1000 miles.

The asphalt of Trinidad is found in a so-called "lake," situated at an altitude of about 100 feet above the sea, and about 3 miles from the shore of the island at the village of La Brea. Its area is about 114 acres and its depth as far as ascertained by rude borings is reported to be about 18 feet at the sides and 78 feet in the center, a bed of blue clay underlying it. If these figures are correct the lake contains about 6,000,000 tons of asphalt, the excavation thus far of 180,000 tons not having appreciably lowered its level. It is an entire misnomer to call it a lake. It is a level tract of brownish material, cracks or fissures, having a width and depth of a few feet, appearing here and there over the surface, a part of them filled with rain water or with dust and vegetation. It is shipped in bulk, and on being unloaded is treated by a slow fire in large tanks for about five hours, the moisture only being expelled without changing its chemical condition. The crude asphalt by analysis of Prof. H. C. Bowen contains 56.79 per cent. of bitumen, 33.99 per cent. of earthy matter, chiefly clay and fine sand, and 9.31 per cent. of vegetable matter.

In its natural state it is too brittle at ordinary temperatures, so that it is tempered with some form of oil, one-third of turpentine and one-sixth of shellac being used for varnish, and one-sixth of petroleum for paving cement or for coating water pipes. Asphalt is employed also as an ingredient in the mixture known as bitile, made by the Callendar Insulating Company, used to insulate electric cables. Mr. Greene cited some interesting applications of asphalt as a cement in masonry work, among others the brick arch spanning the large wrought-iron water main on the high bridge over the Harlem River, and the La Salle street tunnel under the Chicago River. Of the use of asphalt in foundations, two samples are given in a paper read before the English Institution of Civil Engineers in 1880, by W. H. Delano. One was the foundation of a rock disintegrator running at a high rate of speed, first built upon a concrete foundation. On the opposite side of the street was an establishment for painting on glass and china, the business of which was seriously interfered with by the vibrations. After rebuilding the foundation in bituminous concrete the vibrations were imperceptible.

The second case was the foundation of a large trip hammer, weighing 45 tons, erected at the Paris Exhibition of 1867. In order to reduce the concussion, this was built in bituminous concrete with entire success.

Of all the uses made of asphalt, by far the most important is the paving of roadways. During the last 12 years, upward of 3,500,000 square yards of genuine asphalt pavements have been lain in the United States. They extend a length of more than 200 miles, and are used daily by probably 50,000 vehicles. The cubical contents are over 7,000,000 cubic feet, and with their foundations of concrete, of 16,000,000 cubic feet, their weight represents 1,500,000 tons.

The city of Buffalo has now the distinction of having more asphalt pavements than any city in the world, though the combined area of the asphalt and the tar pavements in Washington is still greater by about 50 per cent. The area of the asphalt at Buffalo is 1,000,248 square yards, extending over a length of 51 miles more than the combined area of all the asphalt roadways in Europe.

Mr. Greene described the method of making the asphalt pavement, and noted the following striking illustration of the strength of such a concrete with age: At Washington he observed a small hole in such a pavement, and having had it opened found that the cavity was about 20 x 40 feet in extent and from 4 to 5 feet deep. The earth had been washed into a defective sewer, and it must have taken months, if not a year, for this to occur, the hole in the sewer being quite small. During all this time the pavement was simply a concrete arch 6 inches thick and paving a space of about 20 feet.

Mr. Greene gave the following excellent reason for the fact that a good deal of the so-called asphalt pavement, in reality made of tar, soon becomes worthless: The products of coal tar are subject to oxidation by the atmosphere, which in time renders them brittle and friable and devoid of cementing qualities. The Trinidad asphalt is not subject to this defect, for the reason that it has been exposed for centuries to the burning sun of a tropical climate and the atmosphere can have no further effect upon it. After dealing with these so-called monolithic pavements, Mr. Greene described the block pavements, which are very serviceable under certain conditions. The fact, however, that sand cannot be used in the mixture of the blocks, because it cuts the molds, makes it impossible to employ them for heavy traffic.

One interesting point was raised by Mr. Greene in conclud in ghis paper, and that is the saving in traction force and in wear and tear of vehicles. He stated that it was susceptible of direct proof that if the cost of paving a large city like New York with asphalt be counted, maintaining it at the price shown by years of experience under varying weights of traffic, and if the saving in cost of transportation and wear and tear of vehicles be counted, the saving is nearly three times the cost. The transportation through the streets of New York is something over 40,000,000 ton miles per annum, costing over $15,000,000, and the repairs of its 30,000 vehicles and the shoeing of its 40,000 horses cost nearly $4,000,000 in addition.

The same force that draws one ton over a stone block pavement can draw three tons over asphalt, and the cost of repairs of vehicles and horses can be reduced about one-quarter by the use of smooth pavements. The saving runs into the millions of dollars annually.

During the course of the discussion Dr. Raymond gave the experience of the Brooklyn Subway Commission, of which he is a member, with asphalt pipe, the main difficulty being that in endeavoring to make joints ridges formed on the inside which injured the covering of the cables.

Dr. Julius Pohlman then presented a sketch of his views on the life history of Niagara Falls, in which he took the ground, elaborating his evidence, that the Falls did not cut their way back from Lewiston, but from a point about the present Whirlpool Rapids. He condemned also the opinion so generally held that the Falls moved upward at a slow rate by showing that between 1841 and 1886, the first and last surveys made, the Horseshoe Falls went back 485 feet, or at the rate of about 9 feet a year. Dr. Pohlman's address was received with hearty applause, and he was urged to present his paper in form for the transactions.

Dr. R. W. Raymond then read a paper on "Soaping Geysers." It appears that his attention was directed to it by the story of a party of returned tourists of a Chinese laundryman in the National Park who had included in his cabin a hot spring, of which he was accustomed to avail himself in his business, and who, on one occasion, having thrown a lot of linen into this spring to soak over night, had added a piece of soap to facilitate the process, and had been considerably surprised when, stimulated by this soap, the spring had suddenly become a geyser and wrecked his establishment.

Mr. Arnold Hague, geologist in charge of that part of the Survey which includes the National Park, confirmed the action of soap upon geysers in a letter to Dr. Raymond, and noted the effect of the substitution of soap by lye, which produces much more rapid action. Mr. Hague's letter goes into detail in regard to the results of his investigations, to which Dr. Raymond has added his views on the probable causes of the action of soluble salts thrown into the water.

Thursday had been set aside for a number of excursions, which were to enable the members to inspect the coal and ore docks and elevators for which Buffalo has grown so famous, but inclement weather interfered with the projected tour, only a few undertaking the trip. The afternoon was occupied with a visit to the water works pumping station, the Buffalo Cement Company and the Barber Asphalt Paving Company, a number of carriages conveying the party over a long route through different parts of the city, to enable them to judge by themselves of the difference between the ordinary methods of paving streets and those based upon the use of asphalt.

In the evening the secretary read an interesting paper by Bernard E. Fernow, of Washington, on "Forestry and Mining," and a note by Uriah Cummings, of Buffalo, on the "Artificial Propagation of Mushrooms in the Abandoned Quarries of the Akron Cement Company, at Akron, N. Y."

Friday morning was devoted to a session, the first most important paper being read by R. W. Hunt, formerly of the Troy Steel and Iron Company, and now located at Chicago. We shall present Mr. Hunt's paper in greater detail, but may state that its object was to give the grounds for the adoption of a series of new specifications for rails. Mr. Hunt, we may say in passing, expressed the opinion that, generally speaking, the heaviest sections which have begun to secure recognition in the United States have been disappointing, so far as their wear is concerned, and that in the majority of instances their relative failure to yield adequate wear is due to faulty design. Generally speaking, the increased weight has been secured by a greater depth of metal in the head, a policy which Mr. Hunt questions chiefly on the basis of a long experience in rail manufacturer. He quoted an instance of two rails, a 65-pound and a 60-pound, which were identical except that the additional weight of the former had been secured by adding to the top. The lighter rail gave the better results. Mr. Hunt urges that the rails should be straightened as much as possible when hot, the minimum of work being done by the gagging press, and condemns the application of a gag to flanges. He urges the use of harder steel for heavier rails, and insists that the practice of turning the ingots on their side before their interior has entirely chilled is dangerous, because it is liable to create lengthwise crevices.

R. P. Rothwell, of New York, spoke on the subject of "Electrical Transmission of Power in Mining," the first application of which was made in New Zealand to drive a stamp mill. In Aspen, Col., water-power has been transmitted to the mines, to the pumping and hoisting machinery, and also to the machinery at the coke ovens. A large installation is now being put in at the Nevada mill on the Comstock Lode, water being taken to the level of the Sutro tunnel, giving a 1630-foot head, which drives six 40-inch Pelton wheels, each of 135 horse-power, driving the dynamos direct. The Brush Electric Company have provided the dynamos, each of 135 horse-power, and six electric motors, each of 90 horse-power, which are to drive the machinery of the Nevada mill. The longest transmission thus far has been on the Feather River in California, the circuit being about 18 miles. In Alaska, the water-power on the mainland is to be used to drive 240 stamps, of the famous Treadwell mine.

In the afternoon the Institute visited the works of the Holly Mfg. Company, at Lockport, and the Cowles Electric Reduction Works at the same point. On Saturday morning the members took a special train to Piffards, where they visited the rock-salt mine of the Retsof Company, near that point, the majority of the members being lowered into the 1100-feet shaft and inspecting the underground workings, which are carried on in two beds, one of 20, and one of 60 feet thickness. Above ground they viewed the operations of crushing and preparing the salt for market. Returning to Buffalo, the meeting adjourned.

The Senate Tariff Bill.

We print elsewhere a table giving, so far as it is possible, a comparison of the rates of duty provided for in the Mills and Senate bills with the tariff as it now exists. A study of it will best show where changes have been made and in what direction. We may note, besides, the following points in the Senate bill:

The iron ore clause contains a provision which puts at rest the moisture question, since it specifies "that in levying and collecting the duty on iron ore no deduction shall be made from the weight of the ore on account of moisture which may be chemically or physically combined therewith."

Mill irons and mill cranks of wrought iron, and wrought iron for ships and forgings of iron or steel, or of combined iron and steel, for vessels, steam engines and locomotives, or parts thereof, weighing each 25 pounds or more, are put at 1.8 cents per pound.

The wire-rod clause is specific and reads:

Rivet, screw, nail, fence and other iron or steel wire rods, whether round, oval, flat or square, in coils or loops or in any other shape, not smaller than No. 6 wire gauge, valued at three cents or less per pound, six-tenths of one cent per pound; and iron or steel flat, with longitudinal ribs for the manufacture of fencing, valued at three cents or less per pound, six-tenths of one cent per pound; *provided* that all iron or steel rods, whether rolled or drawn, smaller than No. 6 wire gauge, shall be classed and dutiable as wire.

The law relating to ingots, blooms and billets is particularly extensive, and we quote it as below:

Steel ingots, cogged ingots, blooms and slabs, by whatever process made; die blocks or blanks; billets and bars and tapered or beveled bars; steamer, crank and other shafts; shafting; wrist or crank pins; connecting-rods and piston-rods; pressed, sheared or stamped shapes; saw plates, wholly or partially manufactured; hammer molds or swaged steel; gun-barrel molds, not in bars; alloys used as substitutes for steel tools; all descriptions and shapes of dry sand, loam or iron-molded steel castings; sheets and plates not specially enumerated or provided for in this act; steel in all forms and shapes not specially enumerated or provided for in this act; all of the above valued at 1 cent per pound or less, five-tenths of a cent per pound; valued above 1 cent and not above one and four-tenths cents per pound, six-tenths of 1 cent per pound; valued above one and four-tenths cents, and not above one and eight-tenths cents per pound, eight-tenths of 1 cent per pound; valued above one and eight-tenths cents, and not above two and two-tenths cents per pound, nine-tenths of 1 cent per pound; valued above two and two-tenths cents, and not above 3 cents per pound, one and two-tenths cents per pound; valued above 3 cents and not above 4 cents per pound, one and six-tenths cents per pound; valued above 4 cents, and not above 7 cents per pound, 2 cents per pound; valued above 7 cents, and not above 10 cents per pound, two and eight-tenths cents per pound; valued above 10 cents, and not above 13 cents per pound, 3½ cents per gound; valued above 13 cents per pound, 45 per centum ad valorem.

These provisions compare as follows:

Steel valued	Existing law.	Senate substitute.
1 c. per lb or less	45 per cent ..	½ c. per lb.
1 c. @ 1.4 c..	" ..	6 10 c. per lb.
1.4 c. @ 1.8 c..	" ..	8-10 c. per lb.
1.8 c. @ 2.2 c..	" ..	9-10 c. per lb.
2.2 c. @ 3 c .	" ..	1.2 c. per lb.
3 c. @ 4 c..	" ..	1.6 c. per lb.
4 c. @ 7 c..	2 c. per lb....	2 c. per lb.
7 c. @ 10 c..	2.75 c per lb.	2.8 c. per lb.
10 c. @ 13 c..	3.25 c. per lb.	3.5 c. per lb.
above 13c.	3.25 c. per lb.	45 % ad val.

Plates are not mentioned in the Mills bill. In the Senate bill the clause relating to them reads as follows:

Boiler or other plate iron or steel, except saw plates hereinafter provided for, not thinner than number ten wire gauge, sheared or unsheared, and skelp iron or steel sheared or rolled in grooves, valued at two cents per pound or less, one cent per pound; valued above two cents and not above three cents per pound, one and two-tenths cents per pound; valued above three cents and not above four cents per pound, one and six-tenths cents per pound; valued above four cents and not above seven cents per pound, two cents per pound; valued above seven cents and not above ten cents per pound, two and eight-tenths cents per pound; valued above ten cents and not above thirteen cents per pound, three and one-half cents per pound; valued above thirteen cents per pound, forty-five per centum ad valorem; *Provided*, That all plate iron or steel thinner than number ten wire gauge shall pay duty as iron or steel sheets.

In the case of quite a number of articles changes have been proposed by the Senate Substitute bill, where the existing law and the Mills bill agree. We enumerate them as under, giving the rate of the Senate bill and adding the present rate in brackets. It will be observed that these readjustments are in the direction of a lowering of duties in the majority of instances.

Cast-iron vessels, plates, stove plates, andirons, &c., 1.2 cents per pound [1¼ cents].

Malleable iron castings, 1¾ cents per pound [2 cents per pound].

The Senate bill follows the present law so far as the fact that no allowance is is made for discoloration or partial loss in consequence of rust is concerned. It repeats also that paragraph which defines what material is to be regarded as steel. It has also the following two new clauses:

All articles not specially enumerated or provided for in this act, wholly or partly manufactured, made from sheet, plate, hoop, band, or scroll iron or steel herein provided for, or of which such sheet, plate, hoop, band, or scroll iron or steel shall be the material of chief value, shall not pay a lower rate of duty than that imposed on the sheet, plate, hoop, band, or scroll iron or steel from which they are made, or which shall be the material of chief value.

On all iron or steel bars, rods, strips or steel sheets, of whatever shape, other than the polished, planished, or glanced sheet iron or sheet steel hereinbefore provided for, and on all iron or steel bars of irregular shape or section, which are cold-rolled, cold-hammered or polished in any way in addition to the ordinary process of hot rolling or hammering, there shall be paid one-fourth of one cent per pound in addition to the rates provided in this act; and on steel circular saw plates there shall be paid one cent per pound in addition to the rate provided in this act.

This makes the rates compare as follows:

Bar Iron and Steel.

Existing law.	Senate substitute.
45 % plus ¼ c. per lb.	1.6 c. per lb. plus ¼ c.
2 c. plus ¼ c. per lb.	2 c. per lb. plus ¼ c.
2¾ c. plus ¼ c. per lb.	2.8 c. per lb. plus ¼ c.
3¼ c. plus ¼ c. per lb.	3⅓ c. per lb. plus ¼ c.

Strips of Iron or Steel.

45 % plus ¼ c. per lb.	1.6 c. per lb. plus ¼ c.
2¾ c. plus ¼ c. per lb.	2.8 c. per lb. plus ¼ c.
3¼ c. plus ¼ c. per lb.	3⅓ c. per lb. plus ¼ c.

Sheet Iron.

1.5 c. per lb. plus ¼ c.	1.5 c. per lb. plus ¼ c.

Sheet Steel.

45 % plus ¼ c. per lb.	1.6 c. per lb. plus ¼ c.
2 c. per lb. plus ¼ c.	2 c. per lb. plus ¼ c.
2¾ c. per lb. plus ¼ c.	2.8 c. per lb. plus ¼ c.
3¼	3.5 c. per lb. plus ¼ c.

Steel circular saw plates, 1 cent in addition, making it 4½ cents per pound [3¾ cents and 4¼ cents per pound].

For the following items we do not possess the equivalents in the Mills bill at this writing, but we give the present duties and the provisions of the Senate bill.

Swords, sword blades and side arms: Present, 35 per cent.; Senate, 35 per cent.

Table knives, &c.—Valued at not more than $1 per dozen: Present, 35 per cent.; Senate, 20 cents per dozen + 30 per cent. Valued at $1 to $3 per dozen: Present, 35 per cent.; Senate, 50 cents per dozen + 30 per cent. ad valorem. Valued at $3 to $8 per dozen: Present, 35 per cent.; Senate, $1 per dozen + 30 per cent. ad valorem.

Penknives, pocket-knives, blades and razors: Present, 50 per cent.; Senate, 50 cents per dozen blades and 25 per cent. ad valorem.

Muskets and sporting rifles: Present, 25 per cent.; Senate, 25 per cent.

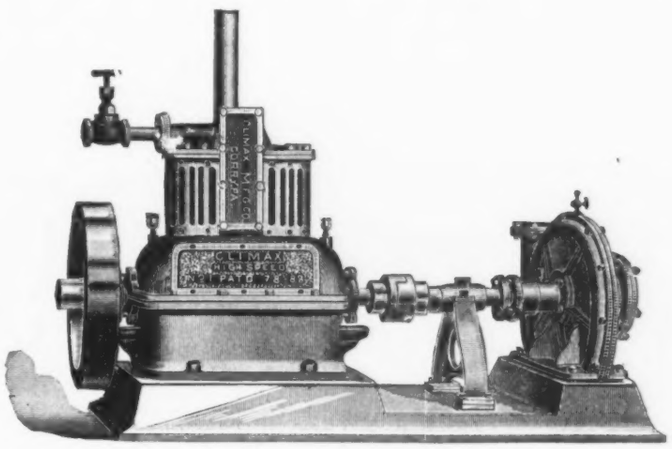
Double-barreled sporting breech-loading shotguns: Present, 35 per cent.; Senate, $10 each and 25 per cent. ad valorem.

Pistols: Present, 30 per cent.; Senate, 30 per cent.

Screws.—More than 2 inches long: Present, 6 cents per pound; Senate, 5 cents per pound. Over 1 and less than 2 inches: Present, 8 cents per pound; Senate, 7 cents per pound. One-half inch to 1 inch: Present, 10 cents per pound; Senate, 10 cents per pound. One-half inch and less: Present, 12 cents per pound; Senate, 14 cents per pound.

It will be observed that the duty on cutlery is to be modified, and that the rates on the larger screws are lowered, while those on the smallest sizes are increased.

The clause on lead ore has the following addition, which it will be observed covers a point to which the trade has given much attention of late—viz.: Lead ore containing silver, or silver ore containing lead, shall pay a duty of one and one-half cents per pound.



SMALL CENTRIFUGAL PUMPING PLANT.

Providence Notes.

The fine steel yacht Ballymena, 148 feet long, was launched from the boathouse of the Herreshoff Mfg. Company, at Bristol, at 8.35 o'clock on the morning of October 6. She is owned by George S. Brown, of the firm of Brown, Shepley & Co., of Baltimore. The Ballymena is the first steel vessel ever built in Rhode Island, and is pronounced to be one of the finest ever built in the country.

The building of the steel torpedo boat for the Government will be begun immediately on the spot from which the Ballymena was launched.

A gang of 30 employees of the American Long-Distance Telephone Company, who have been at work on the line between Worcester and this city, took the Shore Line express train for Bridgeport, Conn., on October 5. From the latter city to New York they will stretch 18 copper wires on poles 50 feet high.

John. A. Moore, whose building was burned down last spring on the Harris farm, Sockanosset, R. I., on which are located the Cranston coal mines, has erected another building, 30 x 40 feet, in which he has placed an engine of 20 horse-power, boiler and crusher. It has a capacity of turning out and crushing about 80 tons of coal a day. The coal from this mine, which, until about three years ago, had remained idle for more than a quarter of a century, has been used continually by Superintendent Eames at the works of the Carbon Iron Company, located on the same farm, for the past year.

The estate of Percy Peck, at Anthony, R. I., consisted of 5 acres of land and the buildings formerly used as a machine shop by S. Colvin & Co., were sold at auction October 2 to Searles Capwell, of Coventry, for $1400.

The will of the late George M. Cruickshank has been proved, and Mary G. Cruickshank appointed administratrix of the estate; bond, $12,000.

The property of the Holmes Burglar Alarm Telegraph Company has been sold, and the right, title and interest of all patents belonging to the Holmes Burglar Alarm Telegraph Company, of New York, and of the Holmes Electric Protection Company have been transferred to the Rhode Island Electric Protection Company for the State of Rhode Island, making it a local company.

LEONIDAS.

James R. Hosmer, Consul-General of the United States to Guatemala, in a report to the Department of State, says there are favorable inducements for the establishment of factories for glass, wagons, agricultural implements and many other articles of general use which are now imported and command exorbitant prices. Common laborers receive from 37½ to 75 cents per day, and railroad laborers $1. American carpenters and painters are paid $4.50 to $5 a day and machinists $5 to $6. American merchants in Guatemala, Mr. Hosmer says, assert that they are compelled to purchase their wares in Europe because the goods sent from America are so carelessly packed as to be badly damaged in transit. American-made prints, agricultural implements and cutlery are preferred to those of other countries, and this has led dealers in Germany to imitate American trade-marks and endeavor thereby to sell their wares as of American make.

Direct Connected Centrifugal Pump.

The Baldwinsville Centrifugal Pump Works, of Syracuse, N. Y., are putting on the market a convenient small-size pumping plant, consisting of a centrifugal pump driven by a direct connected Climax engine. The annexed engraving explains the general design. The engine proper, illustrated in *The Iron Age* some time ago, is of the two-cylinder, vertical, single-acting type. The outfit is cheap, light and durable, and will be found desirable for many locations. Where the lift does not exceed 25 feet the engine is connected directly to the pump shaft, but, in case the lift of water exceeds 25 feet, intermediate cut gears are used, so as to attain the proper speed. The pumps are specially adapted to the use of tanners, contractors and for small irrigating plants.

The Growth of the Stove Industry.

A reception and banquet were given last week by the business men of Boston to visiting merchants, with the object, as explained by Chairman George Hutchinson, of promoting mutual interests. Twelve long tables were spread in Mechanics' Hall, with 1400 plates. Speeches followed by Howard W. Spurr, E. Waldo Cutler, Geo. W. Walker and others. The last mentioned spoke of the marvelous growth of the stove industry, by comparison with what it was 50 years ago. He said: "No longer ago than 1829 stove plates were made from iron flowing directly from blast furnaces in Pennsylvania, Virginia and Kentucky, which was then sent to Albany, N. Y., to be mounted into stoves. Prior to 1829-30 wooden patterns for molding purposes were make of mahogany and strapped with light irons to hold them together. To the late Mr. Annis Lincoln, of Norton, Mass., belongs the distinguished honor of making the first stove plates from metal patterns. The first stoves made by him were supplied with wrought-iron feet riveted to the bottom. I wonder what General Manager Furber, of the Boston and Maine Railroad, would say if a shipment of these stoves were sent to one of his depots for transportation? I reckon he would strike against schedule rates and order them billed by the square foot. Fifty years ago cooking stoves were made with only one pot-hole, but an inventive Yankee conceived the idea of making them with two holes, until now they have more holes than pots. Foreign manufacturers acknowledge the superiority of American stoves by purchasing them and then fitting them for patterns to cast from. Stoves and ranges made in England and Scotland could not be sold in this country except for old iron, but I suppose they answer the purposes of free traders. Until within a few years Canada was a good customer for stoves. The duty of 25 per cent imposed not only protects her mechanics, but deprives us of what was once a lucrative business. From small and crude beginnings the stove business in this country has assumed vast proportions. Our annual product is, in round numbers, not far from 3,000,000 stoves; the value of same is about $45,000,000. Our facilities, quality of iron, mechanical skill and inventive powers cannot fail, sooner or later, of commanding a large share of the stove trade of the world. That our ranges and stoves have no equals made in any other country is an admitted fact. Those made in New England are of the finest grade, consequently meet with a ready sale at home and abroad."

In the Madras Presidency, in India, the River Kistna is crossed by a cable swung between supports 5070 feet apart, and one has just been put up in China 4648 feet in span. The versed sine of the curve formed by this cable is 514 feet. The whole weight of the suspended portion is only 6½ tons, and the breaking resistance 150,000 pounds, so that there would seem to be no great difficulty, by building the supports high enough, in bridging almost any chasm by similar ropes, and establishing footways between them.

The old Huron Furnace, at Jackson, Ohio, which has been idle since 1884, has been generally repaired and was put in operation last week under the management of a new organization, known as the Jackson Iron Company. The iron will be of the Jackson County silvery class, and the furnace has a capacity of 30 tons per day. Messrs. Charles Himrod & Co., Chicago, have been appointed sales agents for the West and Northwest.

THE WEEK.

When may we expect the next killing frost? On account of the unusual importance of this question just now General Greely has issued an extract from the monthly weather review for July, 1888, which gives the average date of its appearance in past years. The inference is that the outlook for the cessation of the epidemic is not very encouraging, the tables showing that, although killing frost has been observed at St. Augustine, on November 30, the average date is December 24, and one year frost did not appear until February 6.

The Knights of Labor, whose next General Assembly convenes in Indianapolis, November 13, are said to be at present in no pressing need of money. A few weeks ago, when the need of money was extremely urgent, recourse was had to the Order's investment in the knitting mills at Little Falls, N. Y., and as a result $5000 was realized. This sum placed the board on their feet again, it is said, and will be sufficient to keep the expenses covered until the payment of the October tax affords relief. In addition to the Little Falls investment, it is said, the Order has money invested in the coke region, which is worth fully $12,000. The headquarters in Philadelphia, for which $45,000 was paid, have been carefully guarded against mortgages or other encumbrances, it is said, and are worth considerably over $50,000 to-day. The printing-office plant, worth $10,000, has also given the Order a foothold, it is claimed, which is not likely to be shaken.

The Spreckels beet sugar factory, at Watsonville, Cal., has just started up, and is expected to turn out 8,000,000 pounds of sugar this season. A rival factory is in operation at Alvarado.

Trade between New Orleans and Mississippi River towns has been very much interfered with by the steamboat quarantine.

The report of the special Park Commission for the appraisal of lands to be taken in this city and Westchester County for park purposes is now on file and shows that the city is called upon to disburse $9,592,000, including $239,860 to defray the expenses of the commission.

The manufacture of big guns at Watervliet arsenal, under the appropriation of $700,000 by the Federal Government for this purpose, will not commence sooner than a year hence, but the buildings will be put under contract in the spring. Col. J. M. Whittemore, the officer in command, says the guns to be made under the new arrangements will vary in weight from 15 to 50 tons. At present 28 men are employed at the foundry. They will turn out annually one 8-inch and one 10-inch seacoast gun and 25 field pieces. The 10-inch gun now constructing will, it is expected, at its best elevation, throw a ball or shell from eight to nine miles. Referring to the cost of the big 15 and 50 ton guns Col. Whittemore said the cost of turning out such work, not including the cost of steel and other material, was estimated to be $1000 per ton. The $700,000 appropriation does not include the making of any guns whatever. That sum is to be expended in building the necessary plant for the construction of 8, 10 and 12-inch guns.

A firm of ship agents in New Orleans have furnished some interesting information showing how money is left in that port by every ship that goes there. The figures are from actual accounts of vessels. The disbursements of the steamship for Queenstown, 1216 tons net, loaded with 86,245 bushels of corn, in April last, were $1500.19, on a total freight bill of about $11,000. The expense account of a British steamship of 1176 tons net, loaded in May with 4800 bales of cotton, footed up $7860.35 out of a total freight bill of $13,639. All this was left in New Orleans, except $2400 for compressing, that having been done in the interior. The expense account of a steamship of 1764 tons net register, loaded in January, 1888, with 207 tons oil cake, was $3018.91 out of a freight bill of about $10,000 or £2117. Of the last named case, $1058.50 was for the stevedore. In the second case, the ship loaded with cotton, the stevedore's bill was $2401. In the case of the Queenstown the stevedore's bill was $525.

The annual meeting of the National Board of Steam Navigation will take place at New York, October 23, instead of Pittsburgh, as originally intended. The change was made after consultation with several of the Pittsburgh members.

The North Georgia and Alabama Mineral and Industrial Exposition, opened in Rome during the quarantine panic, has proved highly successful. The exposition will continue until the 13th inst.

The losses by the floods in Mexico are officially estimated at $3,000,000.

Detroit papers complain that the local authorities are obstructive in their treatment of the proposal to supply the city with natural gas. One of the editors says "the manufacturing interests of the city demand cheap fuel, and the general interest of the city call for compliance with that demand." The argument is that Detroit must have natural gas in order to keep pace with her rivals.

The village of Gloversville, N. Y., has 120 glove manufactories, and Johnstown, in the same neighborhood, 55 more, all employed in working up sheepskin, popularly called "dog skin," together with a small quantity of imported skins, such as the kid and chamois. The annual production has increased to between $6,000,000 and $8,000,000. The manufacturers have always been quick to protest againt fraudulent valuations at the Custom-House.

Norway will be represented at the International Marine Conference, to be held in Washington city in April next.

There is reason to believe that Alonzo Lewis, a traveler for the firm of W. & B. Douglas, manufacturers of pumps, in this city, is the victim of an atrocious murder. His life is supposed to have been taken by negroes, a few miles from Norfolk, Va., to obtain his money.

The Cleveland, Ohio, Board of Industry has collected statistics which show that the sales and products of crude oil in that city during the year reach the very large aggregate of $20,000,000, of which $6,000,000 represents sales of crude for fuel, 10,000 barrels a day, mostly shipped to the Middle and New England States.

The Toronto *Globe* congratulates the people of that city upon the moderateness of the municipal debt and their ability under the law to increase it for any proper purpose. The present debt, it appears, is only $9,000,000, and it can be increased to $11 000,000 without violating the restrictive statute. The interest on such a debt at 3½ per cent. would be $385,000, or $2.57 per head per annum for the population of the city, estimated at 150,000.

The enormous land transactions of the Union Pacific Railroad appear from the annual report of the Commissioners of Railroads which shows that on December 31, 1887, the company had disposed of 12,944,781 acres of land, the total cash receipts from all sales amounting to $26,395,951. There remained outstanding on account of time sales the sum of $13,538,861. The average price per acre for all sales was $2.53 for the Union divison, $3.72 for the Kansas division and $4.24 for the Denver division. The revenue of the road for the year aggregated $25,129,515 and the expenditures $19,297,981, leaving a surplus of $5,831,534. The debt of the company was $222,100,431, and the assets amounted to $266,451,137.

The contractor for the Museum of Natural History in Central Park has commenced work.

The validity of speculative contracts was involved in a decision recently rendered by Judge Holmes, of the Supreme Court of Massachusetts, and is a subject appropriate to the times. The loser in the transaction sought to avoid his obligations on the ground that the dealings in question were contrary to public policy and to the law against gambling. Judge Holmes decided against this view, holding that any party has a right to go into the market and make valid contracts, either for purchase or sale of property to be delivered at any future time, with the understanding and agreement between principal and broker that the property purchased may be resold before the day of delivery arrives, and thus settled by mutual adjustment of the two contracts, or receive upon the contract of purchase and deliver on contract of sale, and that there is no rule of law prohibiting such method of carrying on speculative operations.

The corn crop, which is now past all danger, is by far the largest ever harvested in the United States. It will certainly exceed 2,015,000,000 bushels, an increase of not less than 550,000,000 or 600,000,000 bushels over last year's crop. This fact is full of significance as concerns the general business interests of the country. With such a yield of corn the farmers are sure to receive $200,000,000 more for their crops than in 1887, and that goes a long way toward insuring the prosperity of all classes and industries.

Gibb Ross, a large shipowner and lumber merchant, died at Quebec last week, leaving a fortune estimated at $10,000,000. He owned 45 sailing vessels, over 100 square miles of timber lands and immense blocks of real estate. He was the largest shareholder in the Quebec & Lake St. John Railroad and was the promoter of a scheme to bridge the St. Lawrence at Quebec.

The last brick in the big chimney of Clark's Thread Mills in Kearney, N. Y., was laid 5th inst, and the American flag was hoisted at the top, 335 feet above the ground. It contains 1,700,000 bricks and was begun 150 days ago. The flue is 11 feet in diameter.

The merchants constituting the Chicago Freight Bureau have not abandoned their proposed war on the transcontinental roads for discriminating in freight rates on Pacific Coast business, but no action will be taken until after the meeting of the Transcontinental Association, 15th inst.

Mr. Leary will construct no more big rafts for ocean navigation, as the work of building and then breaking up such great rafts, to say nothing of transportation, creates an expense greater than that of handling the logs by vessels in the ordinary way.

In the race for industrial supremacy Japan is pushing far ahead of China. It was stated some time since that Japan supplies China with cotton-ginning machines, capable of being driven either by water or steam-power. The English Consul at Hiogo now states that an attempt is to be made to manufacture cotton-spinning machinery also, though he is not sanguine as to the early success of the attempt.

Ozaka, where these machines are made, is becoming an important industrial center. It has cotton mills and other factories, chemical works, dye works, &c. In other towns of Japan similar industries are being established. Railways are being built, steam shipbuilding is being carried on with considerable success, and in general terms it may be pronounced that Japan has made a creditable effort to place herself in line with the advanced civilization of the Western nations.

Senator Cullom expresses fear that the bill to amend the Interstate Commerce law will fail, owing to the difficulty in securing a conference in the absence of members of the committee.

Machinery of American manufacture forms a large part of the cargo of the clipper San Joaquin, now loading at this port for Australia.

According to the estimates made by the Finance Committee, the Senate Tariff bill provides for a total reduction of about $75,000,000, made up approximately as follows: Sugar, $27,759,000; free list, $6,500,000; tobacco (internal revenue), $24,500,000; alcohol, in the arts, $7,000,000; other reductions in customs, $8,000,000.

The Metropolitan Phonograph Company have filed their certificate of incorporation in Queen's County. The capital stock is $1,000,000. It is organized for a term of 50 years. Victor E. Burke, of New York, and A. L. Taylor and Timothy Cornwall, of Brooklyn, are the incorporators.

In accordance with a provision inserted in the River and Harbor law of this year, the Secretary of War has designated the following officers to constitute a board to establish harbor lines at the port of New York: Col. H. L. Abbott, Col. W. P. Craighill, Col. C. B. Comstock, Lieut. D. C. Houston and Lieut.-Col W. R. King, all of the Engineer Corps. The Secretary is authorized to establish lines beyond which no piers shall be extended or encroachments allowed. Gen. Casey, chief of engineers, is of the opinion that the piers on either side of the city are within proper limits, but the improvements on the New Jersey side demand immediate attention. The new law is not designed to interfere with the lines established by the harbor commissioners. Those interested will have an opportunity to be heard.

A fine specimen of ironwork, called the new Central Viaduct, is approaching completion in Cleveland, Ohio. The object is to make a crossing over "the Flats," and the contract was taken by the King Iron Bridge and Mfg. Company. The length of the Cuyahoga Valley portion of the bridge is 2838 feet and 6 inches; its hight above the river is 101 feet and the span just put in place is 33 feet above the Nickel-Plate tracks. The draw span over the river is 239 feet long. The cantilever trusses are each 135 feet in length and 20 feet in depth, the long arm being 75 feet and the short arm 30 feet long. It will require another month to complete the ironwork.

The movement of the Mormons into Mexico has assumed large proportions and several flourishing colonies have already been established in the valley of the Casas Grand River. A counter movement is the remarkable migration of Mexicans from Sonora into Southern Arizona and New Mexico as far east as El Paso.

It has been rumored in telegraph circles the past week or two that the owners of the Delancy multiplex system were showing much activity, but these reports did not receive attention until it became known that the Standard Oil Company and a number of the heavy representatives of the Pennsylvania road were interested in a new telegraph company who were in possession of certain valuable patents which would reduce the cost of maintaining electrical communication to less than one-half of the present rate. If the multiplex as at present improved will do half what is claimed for it, it is already proclaimed that a revolution may speedily be looked for in the business of telegraphic communication. It is the purpose of the new company to pay particular attention to commercial transactions between the principal centers of traffic. At night it is proposed to lease wires to the big dailies at $2500 a year.

Turk's Island, in common with Cuba, suffered severely from a hurricane, 2d ult., and 400,000 bushels of salt were ruined. In Cuba the press in general advocates for the free introduction on the island, during a certain time, of all sorts of implements, machinery and apparatus used on sugar estates.

The New York Chamber of Commerce is divided in reference to the location of the new Federal building to be erected, and the subject has been referred to a committee. Merchants who are well informed, in several instances favor the retension of the Custom House where it is, with an enlargement, and the construction of an appraiser's building alone.

Alarm is felt on account of encroachments on the water space of New York harbor by private parties, who are filling in extensive areas on the Jersey shore, now covered by water at all stages of the tide, and the New York Chamber of Commerce petitions the Secretary of War to take such measures as shall prevent serious permanent injury to the channels at the harbor entrance, as the natural dredging process now in operation is liable to be affected if the outflow of water is retarded

The sum of $2,000,000 has been obtained wherewith to build a big bridge between Martin's Ferry and Wheeling, and work will begin at once. The bridge will be 2000 feet long, 90 feet above low water, and built with all "through" spans. The outside estimate of the bridge to be constructed over the Mississippi River at Memphis, by the Fort Scott system, is placed at $3,000,000.

According to a statement of dividend payments by prominent New England cotton manufacturing corporations, that industry just now is enjoying an almost unprecedented prosperity. Thirty-two concerns paid dividends of $1,386,190 on a total capital stock of $17,108,000, an average of over 8 per cent. the first year. One company pays 25 per cent., seven pay 10 to 16¼ per cent. and twelve 6 to 9 per cent. In addition to this showing, most of the mills have been enabled to largely reduce their debt.

The vast preponderance of the internal commerce of the United States, as contrasted with our foreign trade, was forcibly illustrated by Hon. Arden Speare, President of the Boston Chamber of Commerce, in an address delivered last week. He said: "The value of the products carried by our railroads alone in 1887 was $13,043,250,000, or eight times as much as both imports and exports for that year, and the increase of this internal commerce for 1887 was $1,660,000,000, or nearly 2½ times as much as our exports that year." Including coastwise traffic, from which foreign bottoms are excluded, the contrast would be still more startling.

The steel cruiser Baltimore was successfully launched on Saturday, and, on Saturday next the steel gunboat Petrel will be launched from the Columbian Iron Works, at Baltimore. The boilers and engines, built from designs furnished by the Bureau of Engineering, are all completed and will be put in place very soon after the ship is launched. The Petrel is of about 885 tons displacement.

The annual report of the Commissioner of the General Land Office to the Secretary of the Interior contains a statement showing that during the last four years a total of 83,158,990 acres have been restored to the public domain, and over 65,000,000 are recommended for restoration.

The resignation of T. B. Barry from the General Executive Board of the Knights of Labor is the third resignation among the general officers of the Knights of Labor within a few months. The first to go was General Secretary Litchman, and, after him, A. A. Carlton, a member of the board, who resigned last week. In parting Barry launches a bitter shaft at Mr. Powderly.

Thomas Hamilton, a successful wire manufacturer of Philadelphia, died suddenly on Saturday evening in that city, of heart disease. He was 63 years of age.

Justice Brown, of the Supreme Court, sustains the constitutionality of the McEvoy Grain Elevator bill.

Fine Magnetites in the Blast Furnace.

In response to an inquiry from the editor of the *Journal of the Charcoal Iron Workers*, E. S. Moffat, general manager of the Lackawanna Iron and Coal Company, Scranton, Pa., sends the following:

My experience has been chiefly with concentrated Chateaugay (Lake Champlain) ore, and we had so little trouble with it that I feel almost justified in saying that I do not know of any difficulties in its use, up to, say, 50 per cent. of the ore mixture, which is the most I have tried. We used some 10,000 tons of concentrated Chateaugay ore in our Scranton furnaces in 1887, and expect to use a much larger quantity this year. For the past two months (June and July), we have been running the four Scranton blast furnaces, which are in operation, on one-sixth concentrated Chateaugay ore. They have worked just as well as when we were using ordinary furnace ores, no increase of pressure, no irregularities and no trouble of any kind. A few days since I doubled the quantity of concentrated ore in use on our No. 1 furnace (73 feet high x 20 feet bosh), running it up to one-third of the ore charge. The only other change made was a slight decrease of limestone. The speed of the blowing engines and all other conditions being kept the same as before. I rather expected some increase of pressure at the tuyeres, but such has not been the case. The furnace was working well before the change was made, and has worked just as well since. No increase in pressure of blast. No decrease in the number of charges per day and no irregularities of any kind. The fuel used is one-fifth coke and four-fifths Lackawanna anthracite.

During 1887, we ran our No. 5 furnace (70 feet x 19 feet) for several weeks on 50 per cent. concentrated Chateaugay ore. When we made this trial I anticipated a considerable increase in pressure of blast, and in order to meet this increased the proportion of coke to one-third. I afterward concluded that this increase of coke was unnecessary, as the pressure of the blast went down considerably. The furnace worked well on 50 per cent. concentrated ore and showed no peculiarities. None of the concentrated Chateaugay ore is coarser than what will pass through a ¼-inch hole, and most of it very much finer. As different blast furnaces work differently, I would recommend parties commencing the use of concentrated magnetite to try a small proportion at first, say, one-twelfth, and then gradually increase.

MANUFACTURING.

Iron and Steel.

In answer to a report that the Glendon Iron Company, of Easton, Pa., were about to blow in a number of their idle furnaces, we received the following advices from the company, under date of the 4th inst.: "We are repairing two furnaces and have taken on what men were needed. We expect to blow in when ready. We are not booming very much, only shaking off a little of the dust which accumulated during idleness"

The condition of affairs at the various industrial establishments of Norristown, Pa., is reported to be highly satisfactory at the present time. Under date of the 5th inst. we are in receipt of the following advices from that place relating to improvements and changes which have recently occurred: "There is every indication that within a few weeks all the iron mills and furnaces in Norristown will be in active operation. Lucinda Furnace has been overhauled and its capacity increased. It will be put in blast at once. Last week James Hooven & Son dissolved, the senior partner remaining in the business, and on Tuesday the works resumed operations in all departments. A force of men is at work making alterations in the old and abandoned mill of the Standard Iron Company, which is to be fitted for the use of the Steel Car Wheel Company, organized recently. The company, it is said, will commence operations soon. The Stony Creek Iron Works have also resumed."

According to a recent issue of the Sharon *Herald*, the amount of money paid out as wages each month at the following named industries of New Castle, Pa., is as follows: Johnston's Sheet Mill, $20,000; Etna Iron Works, $20,000; Witherow's Works, $12,000; New Castle Wire Nail Works, $10,000; Crawford Iron and Steel Company, $6000; Oliver Bros. & Phillips, $5000; Baldwin & Graham's Stove Works, $4800; Etna Furnace, $4000; Raney & Berger Furnace, $4000; New Castle Paper Mill, $1000; total, $86,000.

On Wednesday, the 3d inst., the head of the blast cylinder at the blast furnace of the Benwood Iron Works, at Martin's Ferry, Ohio, blew out. It will take a week to repair damages.

One of the Pittsburgh papers recently published a long statement to the effect that J. Painter & Sons, the well-known iron manufacturers of that city, had decided to abandon the manufacture of cotton ties, the reason given being inability to realize a profit owing to the low tariff on that product, which admitted of foreign competition. The facts in the case are, that the firm discontinued the manufacture of cotton ties several years ago, and have since been engaged almost exclusively in the manufacture of hoop iron.

It is stated that the Bethlehem Iron Company, of Bethlehem, Pa., have been compelled to close down a portion of their rail mill owing to inability to deliver steel rails ordered by Southern companies because of the yellow fever. No vessels can be chartered for the South until the yellow fever has abated.

James P. Witherow, engineer and contractor, of Pittsburgh, has just completed the erection of a pipe works for the West Superior Steel Company, at Duluth, Minn., which has a capacity for producing 200 tons of cast-iron pipe daily. The foundation has already been laid for a blast furnace to have a capacity of 200 tons per day, work on which has been suspended until spring next year. At that time will also be commenced the erection of a Bessemer steel plant, for which Mr. Witherow also has the contract. The West Superior Steel Company is mainly composed of Western railroad men, and when their buildings are completed, which will be during the summer of next year, they will have one of the largest iron and steel manufacturing plants in the West.

Eliza Furnace, Eliza Iron Company, Wellston, Ohio, blew out last week, and will remain idle for at least the winter months.

Lucy Furnace No. 2, of Carnegie, Phipps & Co., Limited, at Pittsburgh, which has been out of blast for some weeks, will resume operations about the 15th inst. During the stoppage the furnace was relined and otherwise repaired.

The Forsman Malleable Iron and Cast Steel Company have been organized at Louisville, Ky. The capital stock is $30,000, and they will soon erect a foundry for making malleable or soft steel castings.

The Mayville (Wis.) furnace expects to be in active operation by the 10th inst.

Announcement is made that the Jefferson Iron Works, of Steubenville, Ohio, have decided to commence the erection of an additional blast furnace at an early date. It will probably measure 75 x 17 feet, and have a capacity of about 175 tons per day. It is expected the contract will be let in a few days and work be commenced on the furnace as soon as possible.

Star Furnace, Star Furnace Company, Jackson, Ohio, which banked in August for repairs, blew in October 1 after a thorough overhauling.

We are informed by Lean & Blair, engineers and contractors, of Pittsburgh, that the 20-ton Lash open-hearth steel furnace which they erected some time ago at the works of the Standard Steel Casting Company, at Thurlow, Pa., is working very successfully with producer gas, making heats in seven hours. The erection of this furnace to run on producer gas was an experiment, as all other furnaces erected by Lean & Blair are running on natural gas. The complete success of this experimental furnace leaves no doubt but that the Lash furnace can be operated with producer gas with as good results as when natural gas is used. Messrs. Lean & Blair have recently opened a branch office at 168 Washington street, Chicago, under the management of J. H. Reed & Co.

The new Gadsden Furnace of the Gadsden-Alabama Iron Company, at Gadsden, goes into blast the present week.

Miller, Metcalf & Parkin, the well-known steel manufacturers, of Pittburgh, will add to their works a department for the manufacture of common steel. In the quality of their proposed new production the firm hopes to hold the same position they now occupy in the manufacture of fine steel.

The Keystone Rolling Mill Company, of Pittsburgh, are operating their plant double turn in all departments, except the plate mill, which is still idle. Pipe iron is the principal product.

No. 2 Sloss Furnace, Sloss Iron and Steel Company, Birmingham, Ala., blew in last week, and one of the North Birmingham furnaces will shortly follow suit.

The Jefferson Iron Works, of Steubenville, Ohio, has invited bids for the erection of a new blast furnace. It will probably be 75 by 18 feet, will have a capacity of about 150 tons per day, and will be operated in connection with the present furnace of the concern.

The new blast furnace now in course of erection by the Moorhead-McCleane Company, of Pittsburgh, is almost completed, and will be ready for operation within the next 30 days. The stack is 90 feet high, while the bosh measures 18 feet. The cast house will be extended and a new stock house is to be built. A number of important changes are also being made in the rolling mill department by this firm. The blooming mill is being removed, and in its place a new train will be built. The blooming mill is thrown aside by an improvement, which dispenses with one process in converting the bloom into sheets. It is expected that a skelp mill and a merchant mill will be added to the establishment in the near future.

Fanny Furnace, at Shawnee, Ohio, operated by J. C. Hamilton, trustee, will resume operations in a few weeks. A new bosh has been put in, general repairs have been made, and a new brick casting house, 37 x 85 feet, is being put up to replace the old one, recently destroyed by a wind storm.

Copake Furnace, Copake Iron Works, Columbia County, N. Y., which shut down in August, has resumed operations.

The Prospect Rolling Mill Company, of Cleveland, have started business in the old Crucible Steel Company's Works, corner Garden street and the Cleveland and Pittsburgh Railroad. They will manufacture all grades of bar and horseshoe iron and steel tires. The capacity of these works will be about 60 tons daily. They have six furnaces, and they expect to have their works all in complete running order in 40 days.

No. 3 stack of the Phœnix Iron Works, Phœnixville, Pa., blew out on the 6th inst.

Sharon Furnace, at Sharon, Pa., formerly operated by Boyce, Rawle & Co., but purchased some time ago by Spearman, Colcord & Co., will in the future be known as Mount Vernon Furnace. It was put in blast last week.

The buildings for the plant of the Latrobe Steel Company, at Latrobe, Pa., will be made of wrought iron and will be fireproof. The dimensions of the open-hearth steel department will be 250 x 80 feet. Connecting with it will be an L the same length and 40-foot span. The hammer-shops will be 350 feet long, with an 80-foot span, and will have an L the same length and 40-foot span. The company will manufacture tires for all kinds of wheels. About 300 men will be given employment.

The Detroit (Mich.) Iron Furnace was blown in last week.

F. R. Phillips, 407 Walnut street, Philadelphia, Pa., agent for the Solid Steel Company, Alliance, Ohio, reports the sale of a complete set of three-high solid steel nail plate rolls, 22 x 72 inches, to the Ellis & Lessig Steel and Iron Company, Pottstown, Pa.

Sheet mills Nos. 1 and 2, of Howe, Brown & Co., Limited, at Pittsburgh, commenced running 24 hours per day last week. The extra hours of work are rendered necessary by a large number of orders which the firm have recently received.

The Cleveland Rolling Mill Company, of Cleveland, Ohio, have purchased the barbed-wire plant of Billings, Taylor & Co., on Case avenue, and the machinery will soon be transferred to the mills of the company in that city.

The strike in the works of the Spang Steel and Iron Company, Limited, at Etna, Pa., near Pittsburgh, has been declared off by the Amalgamated Association. It commenced in July last when non-union men were employed in the Clapp-Griffith department of the works. The declaring of the strike off by the above-named

organization gives the firm a complete victory, as the only concession made by the firm was an agreement to take back as many members of the Amalgamated Association as places can be found for.

No. 1 furnace of the Cherry Valley Iron Works, Leetonia, Ohio, which has been idle for over a year, resumed blast on the 1st inst.

Machinery.

The partnership heretofore existing between Rees, Shook & Co., founders and machinists, at Pittsburgh, has been dissolved by the retirement of Levi Shook and W. G. Wilmot. The business will be continued by the remaining partner, Wm. M. Rees, at the old stand, No. 46 Water street, Pittsburgh.

The contract for engines, pumps and buildings at the Ridgewood pumping station, in Brooklyn, was awarded to the Washington Hydraulic Company, whose bid was $198,471.

The Globe Foundry Company have recently been organized at Wellston, Ohio, with a capital stock of $15,000. The new firm have purchased the foundry building recently erected by Spellacy Brothers, and will at once equip and put it in operation to manufacture all kinds of miners' supplies, such as cars, tools, &c., and make all kinds of engines, machinery, &c.

Eynon & Ingersoll, of Cleveland, Ohio, manufacturers of machinists' tools, are erecting a new works in that city on Lake street, 100x40 feet, three stories high, with an L on Kistland street 100x40 feet and two stories high. These buildings will be equipped with the latest improved machinery. The firm will carry on the manufacturing of milling machines, boring mills and shapers.

What is claimed to be the largest iron reservoir ever built is to be erected in Malden, Mass. The city has made a contract with the Cunningham Iron Works Company, of Boston, for the sum of $20,940, to build a wrought iron reservoir to contain 1,158,000 gallons of water. It will be 75 feet in diameter and 35 feet high, and built of plate iron ¾ inch in thickness and of a tensile strain of 50,000 pounds per square inch of section.

The Erie Electric Motor Company, of Erie, Pa., have been granted a charter, with a capital stock of $100,000. The shareholders are Wm. W. Reed and C. F. Allis, of Erie; S. T. Everett and E. B. Bangs, Cleveland, Ohio, and J. S. Casement, of Plainesville, Ohio.

The Shields & Brown Company, 240 and 242 Randolph street, Chicago, and 143 Worth street, New York, have just issued a very neat pamphlet illustrating and describing their sectional insulated air coverings for steam, gas and water pipes, drums, heaters, &c. The topics treated of are asbestos cement, asbestos materials, air-chamber coverings, elbow and valve coverings, economy of pipe covering, frost protective covering, hair-felt covering, train-pipe covering, &c. The method of constructing the different classes of coverings, and the manner of applying them, are very plainly illustrated, and the merits of the goods are set forth very convincingly. The pamphlet comprises 24 pages, tastefully covered with blue paper.

The Hill Clutch Works, of Cleveland, Ohio, are remodeling and greatly enlarging their plant, putting in new engine and boiler and considerable new machinery.

The Cochrane Roller Mill Supply Company, of Dundas, Ont., are rapidly completing their new works at Escanaba, Mich. They will have their own foundry for making iron castings. They expect to employ 1000 men when in full operation. By a method which they have perfected they claim to be able to run a 200-barrel flour mill with a 7-inch belt in place of an 18-inch belt heretofore required for such service.

The September sales of boilers by the Babcock & Wilcox Company, of New York, amounted to 16,200 horse-power. This is probably the largest horse-power of stationary boilers ever sold by one firm in that length of time.

The Standard Tool Company, Cleveland, Ohio, are erecting new works on Garden street and C. & P. R. R. The main building will be three stories high and 165 feet long. There will be a separate boiler and engine house, with one-story building attached, 116 x 25 feet; also one-story office and warehouse, 85 feet long by 32 feet wide. The company do not expect to occupy the new works until the beginning of the year. The fact that their present quarters are inadequate for their increasing business is the reason for the erection of these new works.

Hardware.

The Anthony Wayne Washing Machine Company, Fort Wayne, Ind., are producing their well-known "Washer" at the rate of 40 machines per day, and the company are diligently at work upon patterns for a new Washer, which, it is expected, is to be put upon the market within the next 60 days. Their sales up to the present time, although only the second year of their organization, have reached over 8000 machines.

The Enterprise Mfg. Company, Akron, Ohio, under recent date, advise that they have just completed a two-story brick factory building, 30 x 60, and improved the two buildings already occupied by them, making in all three factories in their Akron plant, arranged so that each building is fire-proof, and giving a floor space of two acres devoted to the manufacture of their patented specialties. They are also putting in one Huyett & Smith Mfg. Company's largest size hot blast heaters to heat the different buildings and departments with hot air. Among the new additions to their line of goods is mentioned a sweat pad factory to their harness specialty department, possessing a number of improvements over other styles, particularly in the collar fastener device and for the cork filling used; the pad is medicated. A large trade has been worked up on these goods, while the trade on luminous goods is on the constant increase.

The Horton Mfg. Company, Fort Wayne, Ind., are turning out the Wayne Washing Machines at the rate of 80 per day. The trade on their Superb Corn Planter has been very fair. The company have made an addition to this useful device in the form of an interchangeable plate or disk for planting sorghum or broom corn seed when desired. The change can be made instantly.

We are advised that the Le Page Glue and Cement Company, Gloucester, Mass., have added to the plant twice during the year, and are now putting in a 5-ton digester, which, together with other improvements, will double their present capacity.

Miscellaneous.

In answer to a report that the Nimick & Brittan Mfg. Company, of Pittsburgh, had notified their employees of a 10 per cent. reduction in wages, to take effect on the 15th inst., we are advised that there is no truth in the rumor whatever. The report that a change would also be made in the management of the firm is likewise untrue.

A press dispatch from Beaver, Pa., under date of the 23d ult., says: "On account of the great diminution of the natural-gas supply of the Sheffield district, the Bridgewater Natural Gas Company have decided not to pipe gas to Youngstown, Ohio, hereafter, but to devote all their energies and capital to the Beaver Valley. The pipe line to Youngstown, laid two years ago at a cost of $650,000, will be taken up and made to do service as a main from new wells which the company will drill.

T. William Harris & Co., 44 Broadway, New York, have been awarded the contract for extending the Dobbs Ferry and Hastings Gas Works. New pipes will be laid at both Dobbs Ferry and Hastings.

Licenses to incorporate under the laws of Illinois have been granted to the following companies: The Dieckmann Electrical Company, at Chicago; capital, $100,000; for the manufacture of electric machines and apparatus; incorporators, G. F. Dieckmann, Christain Wahl and David Quigg. The United States Oil and Gas Stove Company, at Chicago; capital, $100,000; for manufacturing; incorporators, E. B. Hamlin, H. J. Baker and J. B. Payne. The Lehner, Johnson, Hoyer Mfg Company, at Chicago; capital, $75,000; for the manufacture of metallic and earthenware goods; incorporators, J. H. Lehner, J. H. Johnson, F. A. Hoyer, T. M. Kent and C. D. Street. The Montague-Woodrough Saw Company, at Chicago; capital, $50,000; incorporators, G. Montague, R. L. Woodrough and H. A. Leland. The Steele Heater Mfg. Company, at Chicago; for the manufacture of all kinds of machinery and appliances for lighting and heating; capital, $1,500,000; incorporators, Wilbur F. Steele, William Grimshaw and J. M. Labold. The Tubal Cain Brass Mfg. Company, at Chicago; capital, $75,000; for the manufacture of brass, iron and copper goods; incorporators, J. H. Lehner, J. H. Johnson, F. A. Hoyer, T. M. Kent and C. D. Street. The Cumberland River Iron and Mfg. Company, of Chicago; capital, $1,000,000; incorporators, William A. Gardiner, Frank B. Dyche and Frank F. Reed. The Chicago Steel Rail Company, of Chicago; capital, $200,000; incorporators, Samuel W. Adams, John Good and William A. Hinkins. The Seamless Fibre Ware Company, of Chicago; capital, $20,000; incorporators, L. C. Rigg, Eber Hubbard and Chas. S. Burton.

We are informed that the Cleveland Silver Metal Company, Cleveland, Ohio, are intending to offer at public sale their whole franchise, including factory, machinery, tools, &c. The company began business about one year ago, manufacturing a new white metal, which they termed "silver metal," in sheets and bars for the trade, and also a line of spoons and forks from this metal, which were put upon the market under the brand of "Silver Metal." The factory is a two-story frame building, 35 x 120 feet, boiler-house one-story frame, 32 x 28 feet, with stone floor, containing one 45 horse-power engine and two boilers; also annealing-house, 32 x 28 feet, and annealing furnace, foundry, one story, 36 x 31 feet, 40-foot brick stack and seven furnaces. The factory is heated by steam, and has the modern conveniences in the way of machinery, &c., for making spoons, forks, &c. The convenience of the location and the fact that the plant is in good order and offered on favorable terms are alluded to.

Recently an axle specification was given out which was particularly rigid. A specimen, ¼ inch x 1 inch, cut from the finished muck axle, was to show a tensile strength of 49,000 pounds, an elastic limit of 26,000 pounds, and an elongation of 15 per cent. in 8 inches. A specimen must bend cold 180° to a curve, the inside diameter of which is 2½ times the thickness of the piece.

The Iron Age

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JOHN S. KING, - - - - BUSINESS MANAGER.

Uniformity in Railroad Classification.

The letters of Chairman Cooley to our Western railroad managers, which we noted in our columns last week, bear upon a subject of importance to all shippers of freight. An amendment to the Interstate law has been introduced into the House, making it compulsory upon the Interstate Commission to arrange a uniform classification for the whole country. This, with other proposed amendments to the Interstate act, is not likely to become law this session, but it emphasizes the chairman's reasoning that unless the railroads make more efforts in this direction, Congress will take the matter into its own hands.

The present confusion in our practice is the source of much annoyance to manufacturers and merchants. As it now stands a shipment to any point outside the bounds of a traffic association is governed by one classification within those bounds and by another and very different one beyond. A through rate under these circumstances is a matter of some little difficulty, whereas such knowledge should be within easy reach of shippers. Because the fourth-class rate is known from shipping point to destination it does not follow that this is the real rate upon an article, because of differing classifications. Thus we have the Official, the Western, the South railway and steamship, the Illinois, the Texas, the Transcontinental classifications, while any merchant's shipments may run into two or more association territories. In these days when the transportation charges make so large a part of the value of an article, such uncertainty is a grave obstacle to perfect commercial freedom and distribution.

On the other hand, the present condition of things is an outgrowth of our national circumstances. Much of the classification confusion previous to April, 1887, was unnecessary, but complete uniformity can be obtained only by the sacrifice of other advantages. The extent of our country is such that we find the greatest diversities in production. In agriculture, Arctic wheat and tropical fruits demand attention; coal mines and ore beds are widely separated. These must be brought together and their exchanges arranged for by our railroads. Thus the classification of oranges and melons is a matter of vital interest to one section, while another has its attention fixed solely on manufactures. It would be unjust to apply the low rate made on coal by the great coal-carrying roads of Pennsylvania to the Western lines. Rigid uniformity is indeed desirable, but the question is an important one whether the shipping public are ready for the readjustment and the consequent leveling up which would take place. Each article would take an average place, a mean between the low classification of our section and the high of another. While if some particular article should clearly take a lower rate than that given to it, the railroads might, with a show of justice, say that they could not put this article in a lower classification, because other sections of the country, not interested, objected; nor could they reduce the rate itself because it would apply to all the items in that class, many of whom did not need any reduction. It is easy to see how many established interests would be affected, while it is a question whether the shipping community would as a whole be one whit better off, for it may be set down as an axiom that our railroad men will try to secure their average net earnings in any event.

There is one loophole of escape—by a system of commodity rates, such as are made freely west of Chicago and such as we find in the official classification on iron and iron manufactures. Under this plan the general classification throughout the country would be made on the compromise system, while each section would obtain special rates on its special products by commodity rates. It is true that this would cause nearly, but not quite, the same annoyance as now, for no merchant could be sure of a through rate without consulting all the commodity exceptions, and we would thus be changing the form of our differing classifications, but not their substance; yet the gain though slight would be something. Every one could go through the exceptions more quickly than through a number of classifications.

If commodity rates should be forbidden and cast-iron uniformity be insisted upon, we look for many protests. The products of the different sections demand and should receive special consideration.

The Blast Furnaces on October 1.

The encouraging outlook for the pig-iron industry has had its influence upon the blast furnace capacity now actively at work. The anthracite furnaces are well employed, but show no marked increase over the capacity of September 1. A few more furnaces have begun work or are preparing to do so, among them the Charlotte, Glendon, Temple and Edge Hill, but it is likely that, on the other hand, some stacks now at work will be found to blow out for repairs. The coke furnaces exhibit greater activity and promise further increase.

Turning to the anthracite furnaces we have the following:

Anthracite Furnaces, October 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York	26	9	2,995	17	3,874
New Jersey	15	4	1,423	11	3,394
Spiegel	3	3	238	0	0
Pennsylvania:					
Schuylkill Valley	35	17	5,191	18	3,690
Lehigh Valley	46	26	9,130	20	4,756
Spiegel	1	1	43	0	0
L. Susquehanna Valley	23	12	5,078	11	2,642
Lebanon Valley	15	14	6,808	1	400
U. Susquehanna Valley	18	9	2,822	9	1,630
Maryland	4	0	0	4	462
Total	186	95	33,728	91	20,988

Practically, therefore, the capacity has remained stationary, nor have we any reports that indicate a notable increase for the current month. For a year past our records show the following:

	Furnaces in blast.	Capacity per week.
October 1	95	33,728
September 1	92	33,541
August 1	93	33,397
July 1	92	32,478
June 1	99	32,418
May 1	96	31,003
April 1	94	30,496
March 1	98	28,598
February 1	97	29,989
January 1	118	38,206
December 1, 1887	122	39,487
November 1	124	40,028
October 1	123	39,440
September 1	125	38,338
August 1	129	37,390
July 1	138	40,742

Among the anthracite furnaces the only change in New York is that Charlotte may blow in this month. In New Jersey Musconetcong is running. In the Schuylkill Valley Lucinda and Edge Hill have probably begun work at this writing, while Mount Laurel, which is putting in a new bosh and lining, is expected to blow in between the 15th and 20th of this month, and Temple is preparing. In the Lehigh Valley Lehigh Furnace went out early in September. In the other districts there have been no changes at all.

The position of the coke furnaces on the 1st of this month was as follows:

The Coke Furnaces October 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week. Gross tons.	Number out of blast.	Capacity per week. Gross tons.
New York	3	1	932	2	1,832
Pennsylvania:					
Pittsburgh district	19	16	16,825	3	2,657
Spiegel	1	1	410	0	0
Shenango Valley	19	14	8,926	5	2,520
Juniata and Conemaugh Valley	21	11	6,045	10	3,340
Spiegel	1	0	0	1	200
Youghi. Valley	5	4	1,510	1	600
Miscellaneous	3	2	1,043	1	550
Maryland	2	1	250	1	120
West Virginia	6	3	1,783	3	1,063
Ohio:					
Mahoning Valley	14	11	8,071	3	2,140
Central and Northern	17	14	9,490	3	1,310
Hocking Valley	14	5	1,531	9	1,980
Hanging Rock	11	7	1,580	4	903
Indiana	2	1	174	1	240
Illinois	13	9	9,903	4	3,120
Michigan	1	0	0	1	250
Wisconsin	4	1	502	3	2,011
Missouri	6	1	436	5	2,135
Colorado	1	1	465	0	0
The South:					
Virginia	11	8	3,678	3	1,853
Kentucky	4	4	977	0	0
Alabama	17	13	6,955	4	2,680
Tennessee	10	8	3,474	2	897
Georgia	2	1	501	1	259
Total	207	137	85,461	70	32,630

	No. of furnaces.	Capacity per week.
October 1st, 1888	137	85,461
September 1	133	81,082
August 1	122	74,355
July 1	121	69,543
June 1	128	75,427
May 1	130	75,815
April 1	128	70,644
March 1	128	68,892
February 1	136	73,912
January 1, 1888	143	83,101
December 1, 1887	144	88,835
November 1	151	90,459
October 1	152	89,123
September 1	145	83,124
August 1	113	62,091

The increase is principally due to greater production in the Pittsburgh district, the Shenango, Youghiogheny, Allegheny and Mahoning valleys, Central and Northern Ohio and the South.

In New York Troy has blown out one of its furnaces. In the Pittfburgh district Clinton, formerly owned by Graff, Bennett & Co., has been started by the syndicate of creditors who purchased the plant some time since, and is making between 40 and 50 tons of iron per day. The repairs on Edith are almost completed, and it will be making iron in this month. Lucy No. 2 is expected to be ready on the

15th inst. It is believed safe to state that every furnace in Allegheny County will be in blast not later than November 15. In the Shenango Valley Florence is idle till November 1, but Rosena and Mount Vernon are at work. In the Youghiogheny Valley Charlotte is at work and Rebecca has resumed. In the Mahoning Valley production is active, the output in September having aggregated 34,591 tons, Himrod, now leased to the Mahoning Valley Iron Company, having been added to the list. Among those furnaces grouped as those of Central and Northern Ohio, Seneca is at work, and Cherry Valley No. 1 is probably now blowing. In the Hanging Rock Eliza has stopped for an indefinite period and Alice is out. Star, which was banked during September, is running again. In the Hocking Valley Crafts began work on the 5th ult. In Wisconsin Mayville is probably blowing at this writing. In the South No. 2 Sloss has resumed, and one of the new North Birmingham stacks is to be lighted at an early date. In Tennessee Sewanee has resumed, while one of the South Pittsburg furnaces has blown out.

Growth of Lake Commerce.

The shipping interests of the country are not dead. On the contrary, the latest statistics of the Commissioners of Navigation afford gratifying evidence of a revival. But the improvement is mainly in the commerce of the great Northern lakes, where iron shipbuilding has received a strong impetus during the past year. The exhibit of the commissioners is as follows, for the first six months of 1887 and 1888, in comparison:

Comparative Statement of Number and Tonnage of Vessels Registered During the Six Months Ending September 1, 1888, and September 1, 1887.

STEAM VESSELS.

	1888.		1887.	
Division—	No.	Tonnage.	No.	Tonnage.
New England	25	5,647	21	4,189
Mid. Atlantic and Gulf	79	13,385	71	20,964
Pacific Coast	44	10,026	32	4,113
Northern Lakes	120	82,550	71	49,224
Western Rivers	44	6,004	42	5,872
Total	312	117,612	237	84,362

SAILING VESSELS.

	1888.		1887.	
	No.	Tonnage.	No.	Tonnage.
New England	65	12,796	58	10,877
Mid. Atlantic and Gulf	130	3,302	130	4,206
Pacific Coast	39	6,790	24	3,734
Northern lakes	35	9,610	22	2,055
Total	269	32,498	234	20,872

Taken as a whole the foregoing is cheering and full of encouragement. To most readers it is a revelation, the average tonnage having increased during the six months covered by the statement from 105,234 tons in 1887 to 150,110 tons in 1888, or at the rate of about 33 per cent. per annum, and the aggregate number of vessels rises from 471 to 581 in the period mentioned. The most notable fact, however, is the increasing activity on the lakes, as appears from the following statistics of the number and tonnage of vessels built on the lakes for six months, ending September 1, 1888 and 1887:

	1888.		1887.	
	No.	Tonnage.	No.	Tonnage.
Steam vessels	120	82,550	71	49,224
Sailing vessels	35	9,610	22	2,055
Totals	155	92,160	93	51,279

Hence it follows that of the total increase of 110 vessels, of 44,876 tonnage, not less than 62 vessels, of 40,881 tonnage, was in the lake department. Shipbuilding on the Pacific Coast meanwhile more than doubled. On the other hand, in the middle Atlantic and Gulf divisions there was a heavy decline.

At the present juncture a cursory review of the principal facts relating to the important traffic springing up on our northern border is not inopportune, especially while our commercial relations with Canada are under discussion, and while Congress is making further appropriations for the improvements at the gateway of Lake Superior, known as the Sault Ste. Marie Canal and the St. Clair Flats. The tonnage employed on the chain of Northern lakes, stretching from the Atlantic to the heart of the continent, as we have seen, is expanding by leaps and bounds. From New York to the head of Lake Superior is 1400 miles, and beyond is the vast agricultural region under the British flag, nearly 1000 miles square and capable of a boundless production of cereals, which is forming connections with the American railway system, and will contribute to the volume of commerce passing through the lakes, steadily augmenting as the years roll on. Although the Canadians have expended about $40,000,000 on public works, exclusive of the $100,000,000 or upward absorbed in building the Canadian Pacific Railway, confident or their ability to control the traffic of the Northwest, it is found in practical experience that "the up-cargo is the life of the trade." In other words, vessels navigating the St. Lawrence River are unable to command the cargoes of coal from the States, and other miscellaneous merchandise for the westward trip which are essential to a profitable voyage in conjunction with the coal and ores received in return. Herein it would appear there has been a serious miscalculation One writer says: "The Canadians have spent about $40,000,000 in digging canals to accommodate this traffic, and still it resolutely refuses to go down the St. Lawrence River. They can fling $50,000,000 or $150,000,000 additional, if they can borrow so large a sum from credulous Englishmen into their canals and river improvements, and they cannot divert one bushel of grain from Buffalo, the Erie Canal and New York."

The growth of the traffic on the basis which now seems to have become established is marvelous. In 1855, when the first lock at Sault Ste. Marie was opened for business, 100,000 tons of iron ore and copper passed through, and five years later the amount was increased to 400,000 tons. In 1875 the amount was 1,260,000 tons, supplying one-third of the ore for the total pig iron production of the United States, and the necessity for another structure of larger capacity for the accommodation of traffic was clearly demonstrated. The additional lock now in use, a noble specimen of engineering, 575 feet in length, was opened for business in 1881, and it was calculated that the saving in the cost of iron ore transportation alone, from Lake Superior was $800,000 in the following year. Seven more years have passed and again there is a demand for enlargement. Works at the present time only fairly begun are estimated to cost nearly $5,000,000, exclusive of a dry dock in contemplation.

A recent special report by Gen. O. M. Poe, relative to the St. Mary's Falls Canal, shows that 5,494,649 tons of freight passed through it last season, and that the freight charges amounted to $10,075,153. The charge by rail would have been as 811 to 183, effecting a saving of $34,557,140 for the single season, or fully $40,000,000 if freight rates were raised to where they naturally would go if it were not for the water route. It would be difficult to set bounds to the ultimate growth of the trade of the Northwest. Is there no hope that our ocean marine will share likewise in the prosperity of the great republic?

Coke Pig Iron at Chicago.

The coke pig-iron trade of Chicago has recently fallen largely under the control of local producers from a variety of causes. When the demand for steel rails was very active, the Chicago rail makers absorbed not only the entire production of their own blast furnaces, but they also placed contracts for Bessemer pig iron with outside furnace companies at Chicago and other points within reach, even purchasing charcoal pig iron in excess of the quantity they were required to use in making rails for some of their most exacting customers. This year the condition of the Western steel trade has so changed that comparatively little Bessemer pig iron has been purchased from outside producers, and some of the furnaces connected with rail mills have been turned on pig iron for sale. The local supply of foundry and mill pig iron was thus so augmented that for a time the price of coke pig iron in Chicago was relatively lower than in any other Northern center of consumption. The low price then established was continued for some time, after the demand for pig iron in other localities had considerably diminished the quantity of competing iron offered at Chicago, thus giving the local producers a still stronger hold on their home market. Notwithstanding the increased production of foundry and mill pig iron at Chicago and in its vicinity, by the furnaces formerly largely employed in making Bessemer pig iron and the new Mayville furnace in Wisconsin, the consumption is now sufficiently heavy to absorb all of it, and to enable the producers to mark their prices up, so that they are more nearly on a par with the competing iron from other sections. Soft coke pig iron, of course, retains its hold upon the Chicago market, not being disturbed by the native product, but other coke irons certainly appear to be almost shut out, and will continue in that condition until either the steel-rail trade resumes its old-time activity, or their prices are forced much lower than now seems probable. The advantages presented by Chicago for the location of blast furnaces to make pig iron for the general market were never so thoroughly established as they have been by the recent events herein set forth. With the constantly growing consumption of iron in that city and its tributary country, it will be remarkable if the number of blast furnaces is not increased in the early future.

Attention is directed every now and then to the use of steam as a means of extinguishing fires, and its advantages, in point of convenience and efficiency, over other methods, are frequently given prom-

inence. As a matter of fact, however, some of the conditions essential to success are, by some, persistently ignored, and it is not surprising, therefore, that there should be instances where the method has failed completely. In order that it may be successful the space in which the fire is burning should be inclosed, so that free access of air should be cut off, and steam under pressure and in ample quantity should then be let into the apartment. The efficiency of the steam in extinguishing the fire is easily explained, being due to the fact that the vapor displaces the air, and, with it, the supporter of combustion, atmospheric oxygen. If these circumstances were given due weight there would be less disappointment and fewer heavy losses where steam jets are depended upon for fire protection. A year or two ago, we believe, reports of experience in Germany with the steam-jet method recorded decidedly unsatisfactory results and inquiries were frequent as to the exact conditions under which it was practiced in American mills, where it was known to have done very good service. The whole secret of success, however, if such it be, is in the correct application of the principles which we have stated.

The Position of Tin.

On June 27, the lowest price for Tin after the collapse was reached in the London market, £75. 12/6, and in our own, 17 cents. Since then the tendency has been gradually upward, till on September 18th London had risen to £104. 15/, and New York to 23¼ cents. Then a downward course set in, depressing London to £100 last week, but recovering at the close to £101. 5/. The extreme advance during the short period of 83 days had consequently been nearly 40 per cent. Great impetus was given to the demand by the reduction in price after the speculative boom came to an end, and on the other hand there is a prospect of more abundant supplies. It would appear, therefore, that the price of £100 is quite high enough, if not too high, to be justified by the actual situation. The statistics of October 1, indeed, proved to be by no means favorable; the visible supply in Europe and America had been reduced but little during Septembe, being 12,451 tons on October 1 as compared with 12,740 on September 1, and 11,907 on October 1, 1887. Apart from speculative causes, the subsequent return to £100 was, therefore, nothing but natural. In our own market the decline in London has exercised but little influence, available tin being scarce, so that even a limited consumptive demand suffices to sustain the price of 23¼ cents on the spot. At the considerably increased value a great impulse has been given to the output of tin in all producing countries, in the Straits, notably, but, on the other hand, the stocks in the hands of dealers have everywhere, it would seem, dwindled to a minimum; hence, even a more abundant supply from the East in the near future may be absorbed without much difficulty. Present values may be tolerably well sustained, unless operators for a fall, through manipulations of their own, succeed in temporarily engineering a drop of some moment.

September shipments from the Straits to this country were unusually large—750 tons, against 450 last year; to England they were 1300, against 1200 tons. Since January 1 they have been 15,900 to both countries taken together, as compared with 14,000 during the first nine months of last year. The opening of the wool season in Australia usually leads to freer tin shipments, hence from now forward larger amounts may be expected from that quarter, too. In Holland September commenced with the following stocks:

	1888.	1887.
Banca stock, slabs	147,036	89,170
Billiton " "	13,468	14,333
Banca afloat "	4,000	2,900
Billiton " "	45,000	47,000
Totals	209,504	153,403

As for the activity in general trade on this side, and the influence it may still have on tin between now and the close of the year, it may be believed that the bulk of the fall business has been done, and, the Presidential election drawing near, it will terminate after a couple of weeks. Nor can the last two months of the year be depended upon to bring much trade, either in tin or the metal branch generally. In Europe business is only fair. Any extraordinary amount of buying in any branch for actual consumption need not be expected during the last quarter of the year. Tin will therefore have to stand on its own merits. It is not overabundant in actual stock anywhere except in Holland, but the amounts afloat are liberal, and they would be too much so but for the light holdings of dealers. At £100 tin, under the circumstances, cannot be called cheap, but at the same time, in spite of the nearly 40 per cent. recovery, it cannot positively be called dangerously dear.

The statistics of production for the first six months of this year, just issued by J. S. Jeans, the secretary of the British Iron Trade Association, confirm the reports of an improvement in trade independent of a demand from this country. The output of pig iron for the first six months of this year was 3,902,804 gross tons, as compared with 3,773,812 tons for the second half of 1887 and 3,668,115 tons for the first half of 1887. Stocks have declined 41,615 tons, leaving them 2,673,860 gross tons, so that the apparent consumption, deducting exports, was 3,442,686 tons, as compared with 3,043,925 tons during the first half of 1887, an increase of 398,761 tons. The report covering the production of Bessemer steel ingots points in the same direction. For the first half of 1888 the output was 1,051,481 gross tons as compared with 915,554 tons in the first half of 1887, an increase of 135,926 tons, South Wales showing the greatest development—from 244,159 tons to 311,468 tons. The rail product developed little improvement, the increase being from 445,785 tons for the first half of 1887 to 487,174 tons in the first six months of the current year, so that, evidently, the greater demand for Bessemer steel was for miscellaneous shapes. This is confirmed by the extraordinary development of open-hearth steel, showing a growth of nearly 50 per cent. this year over last, the figures being 405,390 tons for the first half of 1887, and 616,421 tons for the corresponding period of this year. Scotland leads with 151,416 and 223,192 tons, respectively, the Northeast Coast following with 75,023 and 141,103 tons, South Wales with 80,290 and 131,703 tons. It may be stated that Mr. Jeans reports that 223½ furnaces were employed, 47½ unemployed, and that 30 are under construction.

By way of comparison we may submit the following.

Production of Iron and Steel, Six Months, Gross Tons.

	United States. First half.		Great Britain. First half.	
	1887.	1888.	1887.	1888.
Pig Iron	3,049,295	3,020,092	3,668,115	3,902,804
Bessemer Steel Ingots	1,462,118	1,235,971	915,554	1,051,481
Bessemer Steel Rails	1,021,500	692,197	445,785	487,174
Open-Hearth Steel Ingots	.....	.....	405,390	616,421

We are not in possession of the statistics of open-hearth steel production for the periods under review. Possibly they might make an exception to the rule that there has been a falling off in this country where there has been an increase in Great Britain.

The British Admiralty has just issued regulations which, it is expected, will remove to a great extent the danger of serious explosions in the coal bunkers of vessels of the navy. In past years it was the practice, we believe, to conduct the coaling of British war ships from wharf stores which contained coal that had been for some months exposed to the action of the atmosphere, and which thus had been given opportunity to part with much of its gas. At the expense of using coal which had been allowed in this way to deteriorate, British ships enjoyed reasonable immunity from gas explosions, until more recently a number of accidents of this kind in quick succession, brought about very probably by a departure from the usual method of securing coal supplies, suggested the fitness of some inquiry on the subject. In the new regulations, accordingly, special stress is laid on the fact that in supplying ships the coal should be kept as dry as possible, moisture in some cases being conducive to a rapid development of heat and gas, and in washing down the decks after coaling the bunkers are consequently to be tightly closed. Attention is further directed to the necessity of maintaining good ventilation of the bunkers, and as a last measure of safety the use of naked lights in these is strictly prohibited unless the absence of gas has been definitely assured by direct test. With an efficient system of ventilation, and an even moderate exercise of care, it is difficult to explain why a serious explosion should occur, and future accidents will have to be inquired into chiefly with the view to exposing carelessness in management.

A Coke-Crushing Machine. — The J. M. Schoonmaker Coke Company, of Pittsburgh, have recently placed in one of their works in the Connellsville region a new coke-crushing machine, of which the following is a brief description: In place of the coke passing through a revolving shaft, as is the case with the coke crushers now in operation, with the new crusher it will pass over a number of screens so arranged that all the dust will be kept out of the coke. The different sizes will fall into bins ready for shipment, entirely free from any dust whatever. In passing over the screens and through them the arrangement is such that the coke will not be subject to the friction that is unavoidable in passing through a revolving shaft.

Washington News.

(*From Our Regular Correspondent.*)

WASHINGTON, D. C., October 9, 1888.

The Senate has at last launched its tariff bill upon the sea of discussion. An effort to limit general debate to ten days was declined by the Republicans, who, while they may not consume more than that amount of time, did not wish to bind themselves by agreeing to a fixed date. After general debate shall have ended, the consideration of the bill by paragraphs for amendment will consume much more time. The prospects of reaching a vote before the election are, therefore, not at all flattering.

It is most likely, on the authority of Senator Allison, that about the time the end of general debate shall have been reached the Senate will be willing to consider a proposition from the Democrats to take a recess. If at all, this time will be about the 25th of the present month. The Democrats are much divided upon the question of taking a recess. Speaker Carlisle said to-day that he supposed that everything was agreed to when he discovered that Representative Breckenridge and a few others were opposing the movement, and threatened to demand a quorum if an effort were made to force the passage of a joint resolution to either take a recess or to adjourn. Therefore, matters stand as they were a week ago, and will so remain for at least ten days, when the attempt to come to an understanding about getting away will be renewed.

The majority report of the Senate Committee on Finance is one of the ablest, most comprehensive and satisfying and instructive documents on the subject of the tariff which has been issued. It was under the personal supervision of the subcommittee, Messrs. Allison, Aldrich and Hiscock, assisted by the clerk of the committee, Benjamin Durfee, and the statistician and computer, Mr. Evans. The interesting comparative and statistical data conveys much valuable information. The following is a list of some of the manufactures which the Senate Committee charge would be seriously affected by the reductions proposed in the House bill:

Manufactures of cotton.
All manufactures of wool.
All manufactures of hemp, flax and jute.
Paper envelopes and other manufactures of paper.
Steel railway bars.
Manufactures, articles and wares of iron, steel and other metals.
All manufactures of manila, sisal grass and other vegetable fibers.
China, porcelain, parian and other wares.
Common window glass and the manufactures of glass.
Lead products.
Paints and colors.
Iron and steel rivets, bolts, &c.
Wrought-iron and steel spikes, &c.
Horse, mule and ox shoes, &c.
Cut tacks, brads and sprigs.
Horseshoe, hob and wire nails, &c.
Boiler and other tubes.
Chains of all kinds.
Files, file blanks, rasps, &c.
Iron and steel beams, &c.
Lead in ore and in pigs.
Needles.
Metallic pens.
Type-metal.
Blacking of all kinds.
Manufactures of gutta-percha, hard rubber, &c.
Manufactures of hair.
Ink of all kinds.
Brushes of all kinds.
Marble sawed and dressed, and manufactures of marble.
Manufactures of papier-maché.
Philosophical instruments and apparatus.
Webbing composed of cotton, flax and other materials.
Zinc, dry and ground in oil.
Confectionery of all kinds.

The committee estimate the value of the annual product of these industries to be at least $2,000,000,000, and that in their prosecution employment is given to not less than 1,250,000 persons, while at least 5,650,000 are directly dependent for support on their continued existence and prosperity.

As showing the inconsistencies of the House bill the report charges that in the metal schedule tin plates, or iron and steel sheets coated with tin or lead, are placed on the free list; while iron ore and pig iron, as well as the iron bars or steel billets and slabs from which these sheets must be rolled, are dutiable at from 45 to 60 per cent. ad valorem. A duty is also placed by the bill on common black sheet iron of from 1 to 1.4 cents a pound, and iron and steel sheets, when galvanized with zinc or coated with any other metal except tin or lead, are required to pay an additional duty of from ¼ to ¾ cent a pound above these rates. There is also a duty levied of 1¼ cents a pound upon pig lead.

Iron and steel cotton ties and hoops for baling or other purposes, not thinner than No. 20 wire gauge, are made free; while other hoop, band, or scroll iron is dutiable at rates varying from 1 to 1.3 cents a pound, and an additional rate of ¼ cent a pound is levied on articles wholly or partially manufactured from hoop iron. The iron bars or steel slabs from which cotton ties or hoops must be manufactured are dutiable at from 45 to 60 per cent.

Needles are placed upon the free list, while the duties on steel remain unchanged at not less than 45 per cent. ad valorem.

The report shows that the tendency under protection is to the judicious extension of the free list.

The percentage of importations of free and dutiable articles under the various tariffs which have been in existence from 1846, inclusive, is shown by the following table:

Period.	Dutiable. Per cent.	Free. Per cent.
1847 to 1857....	88	12
1858 to 1861.....	78	22
1879 to 1883.....	70	30
1884 to 1887.....	66	34

It will be seen that with protective legislation, the report says, we have had a much larger and constantly increasing amount of free importations. The protective policy contemplates the free admission of all non-competing articles and of all those in the production of which the benefactions of nature have given other countries permanent advantages over our own.

The operations of the Senate bill are summarized as follows: Importations, 1887, values, $425,082,497: duties, $204,477,083; estimated imports under the Senate bill, $397,236,606; duties, $168,607,645; estimated decrease by Senate bill, $35,869,437; average ad valorem rate of duty present law, 48 21; proposed bill, 42.45.

In this aggregate metals bear the following relation: Importations, 1887, $57,784,719; duties, $23,090,797; estimated imports under the Senate bill, $51,402,136; duties, $21,376,664; estimated decrease of duty by Senate bill, $1,714,132; average ad valorem rate of duty present law, 39.96; proposed bill, 41.58.

An interesting comparative statement is given, showing articles of domestic productions, by sections, and how affected by the House bill. It aims at showing that that measure was devised in hostility to the industries of the North. The comparison is additionally valuable as showing the industrial activity of the two sections. The tariff debate will now run its course for some days. A number of Senators on both sides have speeches to make which will have more or less campaign effect.

The Springfield Iron Company, of Springfield, Ill., have established a branch office in St. Louis, which will be located in Room 164, Laclede Building. It will be in charge of Albert Waycott, formerly connected with their New York office, and also with the Troy Iron and Steel Company.

Underground Forts in Belgium.

In a recent number of *La Nature* Colonel Hennebert, of the Belgian army, describes underground forts which have come into use in Belgium, as one of the principal methods of national defense. One of these underground forts is like an enlarged molehill, and is built of concrete. Measuring 50 m. in length by from 30 to 40 in width, it is about 12 m. below the surface of the ground, and its greatest hight above the earth is no more than 3 or 4 m. It presents the appearance of an elliptical cap placed on the ground, and is scarcely visible to the eye of an observer. At the center of this artificial rock are three armored towers, each with two heavy guns. There are also four small forts, which are pulled in and run out at pleasure, each armed with two rapid-firing guns. At three suitable places there are armored points of observation, from two of which at night the electric light can be flashed to watch the operations of the enemy. Below this surface the earth is hollowed out in the form of a huge well with armored sides, which is divided up into sections, each part protected with heavy armor, one part for provisions and ammunition, another for machinery, which includes the dynamos and accumulators for the lighting of the whole fort, hydraulic machines for working the movable turrets and sending them ammunition, pumps for supplying these machines with water, and a series of ventilators to keep the air pure. Communication with the outer world is made by a subterranean gallery, the length of which varies according to surrounding circumstances. The ceiling of this gallery is from 8 to 10 m. below the surface. To gain access to the fort a hydraulic piston is worked, and this raises a ladder which runs along the whole length of the fort, and lowers the door of the outlet, which is protected by armor 20 c. cm. in thickness, and is under the fire of two of the movable forts. All movements, such as changes of guard, arrivals of supplies, &c., are reported by telephone or telegraph. The guard does not work the hydraulic piston, except at command, and when the sentries in one of the movable forts have reconnoitered the visitors. Finally, the gallery communicating with the outer world is strongly fortified by an armored door defended by two mitrailleuses. One of the greatest objections by generals to forts, that they absorb numbers of men who are wanted in the field, cannot be urged against these subterranean forts, for the garrison consists of 30 or 40 mechanics and specialists only, whose absence would not appreciably weaken the regiment from which they are drawn. The cost of one of these forts is only about $500,000.

It is reported that the Pennsylvania Steel Company, at Steelton, has had a favorable experience with the Archer fuel gas. We understand that 1026 tons of steel were heated in one day with a consumption of only 3 gallons of oil per ton of steel.

The Briggs Iron and Tool Company, Findlay, Ohio, will erect a new forge building, 160x40, on their premises. The new building will contain a 20-bar guide mill. The building to be occupied and used in the manufacture of chain, is rapidly approaching completion, the forges, anvils and machinery being very nearly all arranged in their proper places. The tool department is in continuous and active operation.

The Nordenfeldt, submarine boat, has been purchased by the Russian Government, and is now in the Baltic on her way to Cronstadt.

THE METAL SCHEDULES.

A Comparison of Present and Proposed Duties.

ARTICLES.	PRESENT RATE.	MILLS BILL.	SENATE BILL.
Iron, in pigs, kentledge and scrap	$6.72 per ton	$6 per ton	$6.72 per ton.
Bars or rails for railways—			
Other railway bars, weighing more than 25 lbs. to the yard—			
Iron, tons	$15.68 per ton	$11 per ton	$15.68 per ton.
Steel, or in part of steel, tons	$17 per ton	do	$15.68 per ton
Bar Iron—			
Bars, blooms, billets, or sizes or shapes of any kind, in the manufacture of which charcoal is used as fuel, tons	$22 per ton	$20 per ton	Not less than $22 per ton.
Rolled or hammered, comprising—			
Flats not less than 1 inch wide nor less than ⅛ of 1 inch thick, lbs.	8-10 c. per lb.	7-10 c. per lb.	8-10 c. per lb.; ¾ rounds and squares, 9-10 c. per lb.; smaller to 7-16 1 c. per lb.; 35 per cent. ad val. minimum.
Flats less than 1 inch wide or less than ⅛ of 1 inch thick; round iron less than ¾ of 1 inch and not less than 7-16 of 1 inch in diameter, and square iron less than ¾ of 1 inch square, lbs.	1 1-10 c. per lb.	1 c. per lb.	
Bars or shapes of rolled iron, not specially enumerated or provided for, and round iron in coils or rods, less than 7-16 of 1 inch in diameter, lbs.	1 2-10 c. per lb.	1 c. per lb.	1 1-10 c. per lb.
Bars or rails for railways—			
Flat rails, punched—			
Iron, tons	$17.92 per ton	$15 per ton	$15.68 per ton.
Tee rails, weighing not over 25 lbs. to the yard—			
Steel, tons	$20.16 per ton	$14 per ton	$15.68 per ton.
Iron or steel, flat, with rib, for fencing	6-10 c. per lb.	4-10 c. per lb.	3c. value or less, 6-10c.
Sheet iron, common or black—			
Thinner than 1 inch and not thinner than No. 20 wire gauge, lbs.	1 1-10 c. per lb.	1 c. per lb.	1 1-10 c. per lb.
do No. 20 do No. 25 do do	1 2-10 c. per lb.	1 1-10 c. per lb.	1 2-10 c. per lb.
do No. 25 do No. 29 do do	1 4-10 c. per lb.	1¼ c. per lb.	1 4-10 c. per lb.
do No. 29			1 5-10 c. per lb.
Sheets and plates, pickled or cleaned by acid, or by any other material or process, and cold-rolled—			
Sheets—			
Thinner than 1 inch and not thinner than No. 20 wire gauge, lbs.	1 35-100 c. per lb.	1 35-100 c. per lb.	Polished, planished or glanced, 2 5-10 c. per lb.; pickled, cleaned by acid or cold-rolled, ¼ c addition to common black gauges.
do No. 20 do No. 25 do do	1 75-100 c. per lb.	1 75-100 c. per lb.	
do No. 25 do No. 29 do do	1 75-100 c. per lb.	1½ c. per lb.	
Sheets or plates of iron or steel (except what are commercially known as tin plates, terne plates and taggers tin), galvanized or coated with zinc or spelter, or other metals, or any alloy of these metals—			
Thinner than 1 inch and not thinner than No. 20 wire gauge, lbs.	1 85-100 c. per lb.	1¾ c. per lb.	¾ c. per lb. in addition to sheet iron duties.
do No. 20 do No. 25 do do	1 95-100 c. per lb.	1 60-100 c. per lb.	
do No. 25 do No. 29 do do	2 25-100 c. per lb.	2 15-100 c. per lb.	
Tin plates, terne plates and taggers tin	1 c. per lb.	Free	1 c. per lb.
Hoop, band, scroll or other iron, 8 inches or less in width	1 c per lb.	1 c. per lb.	
Thinner than No. 10 and not thinner than No. 20 wire gauge, lbs.	1 2-10 c. per lb.	1 2-10 c. per lb	1 1-10 c. per lb.
do No. 20 wire gauge, lbs.	1 4-10 c. per lb	1 3-10 c. per lb.	1 3-10 c. per lb
Cotton ties	35 per cent.	free.	2-10 c. per lb. in addition to duty on hoops from which made.
Cast iron pipe of every description, lbs.	1 c. per lb.	6-10 c. per lb	9-10 c. per lb.
Nails, spikes, tacks, brads or sprigs—			
Cut nails and spikes of iron or steel, lbs.	1¼ c. per lb	1 cent per lb.	1 c. per lb.
Cut tacks, brads or sprigs—			
Not exceeding 16 ounces to the thousand, M.	2½ c. per M	35 per cent.	2¼ c. per M.
Exceeding 16 ounces to the thousand, lbs	3 c. per lb.	do	2¾ c. per M.
Railway fish-plates or splice-bars of iron or steel, lbs.	1¼ c. per lb.	8-10 c. per lb.	1 c. per lb.
Nuts and washers of wrought iron or steel, lbs.	2 c. per lb.	1½ c. per lb.	1 8-10 c. per lb.
Horse, mule or ox shoes, lbs.	do	do	do
Spikes of wrought-iron or steel, lbs.	do	do	do
Anvils	do	do	2 c. per lb.
Anchors and parts thereof, &c.	do	do	1 8-10 c per lb.
Rivets, bolts with or without threads or nuts or bolt-blanks, and finished hinges or hinge-blanks of iron or steel, lbs.	2½ c. per lb	1½ c. per lb.	2½ c. per lb.
Blacksmiths' hammers, sledges, &c., lbs.	do	do	2¼ c. per lb.
Axles, parts thereof, axle-bars, axle-blanks or forgings for axles without reference to the stage or state of manufacture, of iron or steel	do	do	2 c. per lb.
Forgings of iron and steel, or forged iron of whatever shape or in what stage of manufacture, not specially enumerated or provided for, lbs.	do	do	2 3-10 c. per lb., 45 per cent. adval. minim.
Horseshoe nails, hob nails, wire nails, &c., lbs.	4 c. per lb.	2½ c. per lb.	4 c. per lb.
Wire nails—			
Two inch and longer, not lighter than No. 12 W. G.	4 c. per lb.	2½ c. per lb.	2 c. per lb.
1 to 2 inches long, lighter than No. 12, and not lighter than No. 16 W. G.	4 c. per lb.	2½ c. per lb	2½c. per lb.
Shorter than 1 inch and lighter than No. 16 W. G.	4 c. per lb.	2¼ c. per lb.	4 c. per lb.
Tubes or flues or stays, of wrought iron or steel—			
Boiler-tubes or flues or stays, lbs.	3 c. per lb.	1½ c. per lb	2½ c. per lb.
Other tubes, lbs.	2¼c. per lb.	do	do
Chain or chains of all kinds, made of iron or steel—			
Not less than ⅜ of 1 inch in diameter, lbs	1¾ c. per lb.	1½ c. per lb.	1 6-10 c. per lb.
Less than ¾ of 1 inch and not less than ⅝ of 1 inch in diameter, lbs.	2 c. per lb.	1½ c. per lb.	1 8-10 c. per lb.
Less than ⅝ of 1 inch in diameter, lbs	2½ c. per lb.	2 c. per lb.	3 cents per lb.
Saws:			
Cross-Cut	8 c. per lin. ft.	8 c per lin. ft.	6 c. per lin. ft.
Mill, pit and drag, not over 9 inches wide.	10 c. per lin. ft.	10 c. per lin ft.	8c. per lin ft.
Mill, pit and drag, over 9 inches wide	15 c. per lin. ft.	15 c. per lin. ft	13 c. per lin. ft.
Circular saws	30 per cent. ad val.	30 per cent. ad val.	30 per cent. ad val.
All other saws	40 per cent. ad val.	30 per cent. ad val.	40 per cent. ad val.
Files, file-blank, rasps and floats of all cuts and kinds—			
4 inches in length and under, doz.	35 c. per dozen	35 per cent.	35 c. per dozen.
Over 4 inches in length and under 9 inches, doz.	75 c. per dozen	do	75 c. per dozen.
9 inches in length and under 14 inches, doz.	$1.50 per dozen	do	$1.30 per dozen.
14 inches in length and over, doz.	$2.50 per dozen	do	$2.00 per pozen.
Beams, girders, joists, angles, channels, car-truck channels, TT columns and posts, or parts or sections of columns and posts, deck and bulb beams, and building forms, together with all structural shapes of iron or steel, lbs.	1¼ c per lb.	6-10 c. per lb	1 1-10 c. per lb.

Articles.	Present Rate.	Mills Bill.	Senate Bill.
Wheels of steel, and steel-tired wheels for railway purposes, whether wholly or partly finished, and iron or steel locomotive, car, and other railway tires, or parts thereof, wholly or partly manufactured, lbs	2½ c. per lb	2 c. per lb	2½ c. per lb.
Bars, billets, blooms, blanks, ingots, &c., of steel, ingots, clogged ingots, blooms, or blanks, for railway wheels and tires, without regard to the degree of manufacture, lbs.	2 c. per lb	1½ c. per lb	1¾ c. per lb.
Wire :			
Not smaller than No. 10	1½ c. per lb	Same as now, but 60 p. c. maximum	1¼ c. per lb.
No. 10 to No. 16	32 c. per lb		1¾ c. per lb.
No. 16 to No. 26	62½ c. per lb		2¼ c. per lb.
Smaller than No. 26	3 c. per lb	do	3 c. per lb.
Covered with cotton, silk or other material	6 c. per lb	do	45 per cent. ad valorem.
	6½ c. per lb	do	do do
	7 c. per lb	do	do do
Wire cloth and netting	2 c. to wire same gauge.	do	2 c. to wire same gauge.
Galvanized wire	½ c. add to wire.	do	½ c. add to wire.
Wire rope and strand, iron	1 c. add to wire.	do	1 c. add to wire.
do do steel	2 c. add to wire.	do	2 c. add to wire.
Wire valued at 10 c. or more	2½ c. per lb	do	45 per cent. ad valorem.
	3 c. per lb.	do	do do
Clippings from new copper not separately enumerated, lbs		1 c. per lb	1¾ c. per lb.
Copper in plates, bars, &c, lbs	4 c. per lb	2 c. per lb	2 c. per lb.
do brazier plates, lbs	35 per cent.	30 per cent	35 per cent.
do ore	2½ c. per lb	Free	1¼ c. per lb. fine.
do regulus	3½ c. per lb.	do	1¾ c. per lb. fine.
Old copper	3 c. per lb	do	1¾ c. per lb.
Lead, and manufactures of—			
Molten and old refuse lead, run into blocks and bars, and old scrap lead, fit only to be remanufactured, lbs	2 c. per lb	1¼ c. per lb	2 c. per lb.
Lead ore and lead dross, lbs	1½ c. per lb	¾ c. per lb	1½ c. per lb.
Pigs and bars, lbs	2 c. per lb	1¼ c. per lb	2 c. per lb.
Sheets, pipes, and shot, lbs	3 c. per lb	2¼ c. per lb	2½ c. per lb.
Sheathing metal, lbs	35 per cent.	30 per cent	35 per cent.
Nickel, in ore, matte, or other crude form, &c	15 c. per lb	10 c. per lb	5 c. per lb. in ore. 10 c. per lb. in matte. 15 c. in metal, oxide or alloy.
Zinc ores, not enumerated		20 per cent	
Zinc, spelter or tuteaegue—			
In blocks or pigs, lbs	1½ c. per lb	1¼ c. per lb	1¾ c. per lb.
Old worn out, fit only to be remanufactured, lbs	do	do	1¼ c. per lb.
In sheets, lbs	2½ c. per lb	2 c. per lb	2½ c. per lb.
Hollow-ware, coated, glazed or tinned, lbs	3 c. per lb	2½ c. per lb	2½ c. per lb.
Needles :			
For knitting or sewing machines	35 per cent	20 per cent	35 per cent.
For sewing, darning, knitting	25 per cent	free	25 per cent.
Pens, metallic, gross	12 cents	35 per cent	12 cents.
Type metal	20 per cent	15 per cent	1½ c. for lead contents.
New type for printing	25 per cent	do	25 per cent.
Manufactures of copper	45 per cent	35 per cent	35 per cent.
Machinery not elsewhere specified	do	40 per cent	
Wire rods of steel, not elsewhere specified, lbs	do	do	Not smaller than No. 6, 6-10 c. per lb.
All other manufactures of iron	do	do	
" " " steel	do	do	
Manufactures of lead	do	do	45 per cent.
" " nickel	do	do	do
" " pewter	do	do	do
" " tin	do	do	do
" " zinc	do	do	do
" " gold and silver	do	do	do
" " platinum	do	do	do
" " brass	do	do	do
" " bronze	do	do	do
" " metal not elsewhere specified	do	do	do

NOTE.—For changes in iron castings, malleable-iron castings, boiler plate, steel ingots, blooms and billets, iron and steel of irregular section, cutlery, screws, &c., see article published elsewhere.

Andrew Carnegie on Trusts.

Mr. Andrew Carnegie returned from Europe this week, in company with Henry Phipps and W. R. Jones, and was promptly interviewed, the principal part of his talk being confined to discussing trusts. He is reported as having said:

The truest words that can be said about trusts are that no one has much cause to fear trusts except he who goes into them. There is no possibility of maintaining a trust. It is bound to go to pieces sooner or later, and generally to involve in ruin those foolish enough to embark in it. if successful for a time and undue profits accrue, competition is created which must be bought out, and this leads to fresh competition, and so on until the bubble bursts.

Then the article which it was proposed to enhance in price is made for years without profit, and the consumer has his ample revenge. When you find me trying to organize any steel rail trust, set it down that softening of the brain has surely begun. There should be displayed in the office of any trust an illuminated text:

" If I was so soon to be done for,
I wonder what I was begun for."

It has been vigorously maintained by free traders and others that the protective system produces trusts.

It has no more to do with trusts than with the tides. The chief trusts are in Europe. The copper syndicate is a French trust; the salt trust is English, and the greatest trust I have ever known was the steel rail trust in England, which embraced the Continental works as well. Of course it went to pieces, as is the nature of trusts, and as a consequence the foolish combiners have ever since been bestowing steel rails upon an ungrateful world for less than cost.

The public may regard trusts or combinations with serene confidence, for the great law cannot be broken—namely, that where there is no monopoly, but every one is free to embark in the business, it is impossible for any body of men to exact from this people for any length of time more than the average return for capital and labor. Whenever undue profits are made, competition soon steps in.

It is the same with railroads. New York Central has its West Shore and the Milwaukee St. Paul as its rival. Notwithstanding all we hear of railroad pools, the result is that America enjoys the cheapest and best railroad transportation in the world, just because there is no monopoly. People can build other railroads, and build them they will, whenever any one line is seen to reap dividends beyond the average. Just so with trusts. Watch the end of the copper or coffee or sugar trusts, or salt, or European steel rail trust, and you will see that this great law will be obeyed.

It is natural that manufacturers should meet and resolve and re-resolve in a period of depression that they will stop bleeding each other to death; but I have never known an attempt to defeat the law to be permanently successful. When I was very young in business and not very strong financially, I used to hope that something could be done in the way of combination with others to prevent impending ruin. But the result was always a failure, and often personal bitterness between men who had before been on good terms with each other, and then a renewal of the fierce struggle with increased energy.

The fatal weakness of all trusts is that if successful temporarily they cause permanent injury, for under higher prices other concerns grow strong. They may have a million of dollars to lose, rather than risk the cost, disorganization and danger of a stoppage of the works. This is the case in England to-day. Since the trust broke in steel rails there has been a struggle as to which should crowd out the others, and for several years this has been carried on. To be permanently successful the manufacturer must make up his mind that the day of exorbitant profits is at an end and take a small profit per ton or per

yard, and make great quantities and let the consumer have everything cheap.

Then you mean to say that there is no trust in steel rails?"

Not any more than there is among the morning newspapers of New York. We can no more combine than the newspapers. There are 14 steel rail mills in the country and a new competitor just about ready to start. Every mill manages its own business and fixes its own prices. Just look at the situation. Rails sold for $40 per ton this time last year because all the mills, running night and day, could not supply the demand. There was no artificial raising of prices. To-day they have fallen to $28 per ton because there is not demand for all the mills can make. Not much of a trust here, is there?

No trade in this country is more disastrously competed for than that of steel rails, and there never was and never could be a trust created that would last through a period of depression. Any railroad company can to-day exchange a ton of its old, worn-out rails and get a ton of new steel rails by paying $5 difference. This is what a protective duty has done in a few years. It has tempted so much capital into the manufacture of steel rails that no manufacturer can hope to get a fair dividend upon the capital except through works of recent construction, favorably located, and the closest and most skillful management.

The consumer gets steel rails for $28 per ton, and has not paid more than $40 per ton for years even when a great boom was on and every one wanted rails in a hurry. Yet you will find now and then some professor writing in his closet who knows nothing but what he reads in old English text-books that the duty is added to the cost and paid by the consumer. The total cost of rails to-day is only the amount of the original duty imposed—viz., $28 per ton. If these doctrinaires are right that the consumer pays the amount of the duty, then, deducting the $28 duty, there would not be a cent left for the rails. It's the fashion just now to assert that manufacturers of steel rails in this country have made unusual profits. Nothing could be more groundless. The capital invested in the Bessemer steel rail manufacture, taken as a whole, has not paid interest. If the business is so profitable why don't those who think so invest in it? They need not build new works. The shares of many of the existing works can be bought any day through brokers for less than the capital invested, as shown by the books of the concerns. We make much more iron and steel in various shapes than we do rails, for rails have not paid us as much per ton as other forms. The rail business is good about one year in four, and then for four years manufacturers are fortunate who pay their interest account, competition is so terribly severe.

An Electric Crane.—At the recent meeting of the British Association for the Advancement of Science Mr. W. Anderson read a paper on "The Application of Electricity to the Working of a 20-ton Traveling Crane." He explained that one of the traveling cranes at Erith Iron Works, England, was originally constructed to be worked by hand, but preparation had been made to apply wire rope driving. The inconveniences of this plan were considerable, and electricity was introduced as a motive power, a dynamo being fixed in the boiler-house for this purpose. The motor was shunt-wound, and provision was made for varying the power and speed to suit the requirements of the foundry. A single attendant could work the machine, which had worked satisfactorily since June last. About 65 per cent. of the power developed in driving the steam-engine was utilized. One or two more electric cranes were at work in other factories.

CORRESPONDENCE.

The Babcock & Wilcox Company.

To the Editor: You have done me the honor to copy a letter which I wrote to the New York *Times* from Holland in regard to the shipment by the Babcock & Wilcox Company of boiler tubes from this country to Glasgow. I notice that through an error of the types either in the office of the New York *Times* or in yours I am made to say that the sales of our company for the month of June required 1,000,000 feet of 4-inch tubes, whereas I wrote 100,000. The error is merely one cipher, but it is worth correcting, as I would not have any one suppose that I would deliberately make so wild a mis-statement. I thought that 100,000 feet of tubes in a month was a sufficient quantity to make a note of. Though the sales for the month of September are nearly twice as great as those for June, we do not hope to get up to the 1,000,000 feet per month—at least for some time to come. Very truly yours,

GEO. H. BABCOCK.

Engines of the Steamer Connecticut.

The steamer Connecticut, built for the Providence and Stonington Steamship Company, is provided with an engine of a type not unusual abroad but almost new here, and differing widely from the beam engine which has been almost universally employed in our Eastern waters. This engine was, like the boat itself, designed by Mr. George B. Mallory, and has been built under his supervision by the William Cramp & Sons Ship and Engine Building Company, of Philadelphia. It is a compound oscillating engine—the largest of the kind ever built in this country—having a high-pressure cylinder 56½ inches diameter and a low-pressure cylinder 104 inches diameter, both having 11-foot stroke.

The steam-port nozzles for the high-pressure cylinder are 6 x 41 inches inside, and those for the low-pressure cylinder 8½ x 100 inches inside. The steam passes through the high-pressure trunnion through a composition stuffing-box sleeve 24 inches inside diameter, surrounded by stuffing-boxes and double air spaces. From the trunnion it passes through a side pipe 18 inches inside diameter to the valve-chest. From the exhaust chests the steam passes to the exhaust trunnion through a 22-inch side pipe. The high-pressure exhaust trunnion is connected with the low-pressure trunnion by a receiver pipe 26 inches inside diameter, having an easy bend and surrounded by a steam-jacket with 2-inch spaces. The exhaust side pipe on the low-pressure cylinder is 33 inches diameter; from the exhaust trunnion the steam passes through a grease extractor, and thence to the steam space in the surface condenser through a copper pipe 33 inches diameter.

The cylinders are cast without heads, the heads and steam-chests being bolted on; the upper head of each cylinder is fitted with heavy double brackets for guides for each piston-rod, those for the small cylinder being 15 inches, and those for the large cylinder 21 inches long. The pistons have cast-iron rings, and steel springs are provided for setting out these rings. The piston-rods for the high-pressure cylinder are 9 inches, and those for the low-pressure cylinder 10 inches diameter. The valve-gear is Wheelock's improved gridiron, with automatic trip cut-off. The steam opening on the high-pressure cylinder is 6½ x 52 inches, and the exhaust opening 11½ x 52 inches, while on the low-pressure cylinder the openings are 9⅞ x 102 inches and 19½ x 102 inches, respectively. The valve motion is of the link type, and there are three eccentrics, two for the link and one for the cut-off. A small steam engine is provided for working the reverse-lever and adjusting the valve-gear. The surface-condenser is of cast iron, box form, containing 3916 brass tubes ⅝ inch outside diameter, the distance between the tube-sheets being 16 feet. The exposed surface is about 12,150 square feet. An auxiliary condenser is also provided, having about 750 square feet of exposed tube surface.

There are two single-acting air pumps 35 inches diameter and 17-inch stroke; four feed pumps 5 inches diameter and 17-inch stroke, and two bilge pumps of the same size. These eight pumps are arranged in two sets of four each, worked from a horizontal crankshaft, and between the two sets is placed the engine which works them, a compound engine with high-pressure cylinder 14 inches, low-pressure 24 inches diameter, both 17-inch stroke. There is also an auxiliary air and circulating pump. The main circulating pump is a centrifugal pump with suction and delivery pipe each 16 inches in diameter. The engine is carried by two heavy keelsons of steel plates and angle irons, upon which are the A-shaped gallows frames of box girders built up of wrought-iron plates and angles. These frames are connected by sway braces, and carry on top the pillow blocks for the main shaft. The keelsons rest on yellow pine keelsons on top of the cross floors, and are securely bolted to and through the hull timbers. The condenser is carried on the after end of the steel keelsons. The crank is of the built-up form, the crank pin having a bearing 18 inches diameter and 49 inches long. It is shrunk into one crank arm, and secured by a nut at one end and gibs at the other. The crank arms are also shrunk on and keyed to the ends of the two shafts, each of which is 33 feet 6 inches long, and has journals 23 and 25 inches diameter.

The boat has feathering paddle-wheels 28 feet diameter between centers of the bucket trunnions. There are 12 buckets, each 14 feet face and 4 feet 6 inches wide. The buckets are of oak 4½ inches thick. The wheel-frame carries bearings for the bucket trunnions, and the feathering motion is given by eccentrics keyed on the main shaft. Steam is furnihsed by six boilers of the "gunboat" type, each 12 feet 6 inches diameter and 20 feet 1¾ inches extreme length. These boilers carry 120 pounds working pressure, and are of steel, all rivet holes drilled, the outside shell ¾ inch thick. In each boiler there are three corrugated furnaces 48 inches inside diameter and 7 feet 6 inches long; back of the furnaces is a deep combustion-chamber from which run 424 tubes 3¼ inch diameter and 8 feet long. The boilers are arranged in two sets of three each, and over each set is a superheater 11 feet diameter and 12 feet extreme hight, having a single flue 7 feet 6 inches diameter. The smokestacks stand directly on the superheaters. There is also a donkey-boiler of the locomotive type 7 feet diameter of barrel and 12 feet long over all, made of steel. It has 156 tubes 3 inches diameter. Six independent steam pumps are provided for feed and other purposes. The engine is expected to develop about 4500 indicated horse-power at 25 revolutions per minute with a full load—about 500 tons—on board. When driven at full power, 5500 horse-power will be developed, and a speed of 19½ miles per hour obtained for the vessel.

The Jarecki Mfg. Company, Limited, of Erie, Pa., are building a small addition to their works to meet the demands of increasing business.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington St., CHICAGO, October 8, 1888.

Pig Iron.—Some improvement is to be noted in the demand, and prices show a renewed upward tendency. The advance now in progress is mainly confined to the brands which have been selling at the lowest figures, makers finding that the market is in condition to sustain an additional 50¢ to $1 per ton. The change in quotations is, consequently, a revision of inside figures. There is also such a demand for high numbers of Lake Superior Charcoal, due to the scarcity of Old Car-Wheels, that some furnace companies have advanced their price of Nos. 4 to 6 from 50¢ to $1 above the lower numbers. The scarcity of Pig Iron for immediate shipment has been pretty thoroughly demonstrated by the experience of some of the dealers during the past week. Desiring to accommodate some of their customers, and their own furnaces being sold up, they have applied to a considerable number of other furnaces without being able to secure any quantity. The immediate demand being for small lots, consumers are supplied by this scouring of the sources of production, but if larger quantities should be called for there would certainly be a deficiency in the supply, causing either a sharp advance in price or the starting up of additional furnaces now standing idle. Some indications of such a demand are now visible, inquiries being received for round lots from heavy consumers who have evidently not fully covered their requirements. The architectural foundries are very quiet, but other foundries are quite busy. The advance in freight rates mentioned in last week's report was not on Pig Iron from the Mahoning and Shenango valleys, but on Southern Pig Iron. The rate from Birmingham to Chicago is now $4.15. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Charcoal, all numbers, $20 @ $21; Alabama Car-Wheel, $26.25; Jackson County Softeners, No. 1, $17.50 @ $18.50; Hocking Valley Soft Foundry, No. 1, $17.50 @ $18; American Scotch (Blackband) No. 1, $19.75 @ $20; other Ohio Scotch Irons, No. 1, $18 @ $19; Lake Superior Coke, No. 1, $18.50 @ $19; No. 2, $17.50; No. 3, $16.50; Southern Coke, No. 1 Foundry, $18 @ $18.50; No. 2 Foundry and No. 1 Soft, $17.50; No. 3 Foundry and No. 2 Soft, $16.75 @ $17; Gray Forge, $16.25 @ $16.50.

Bar Iron.—Business shows a little improvement, though the demand is by no means general. The mills are so well supplied with work, however, that dullness could probably continue for some weeks yet without affecting prices very much. Buyers are endeavoring to secure better terms by various ingenious devices, but they have little prospects of success so long as manufacturers have plenty of orders on their books and at the same time find raw material as dear as it now is. Car orders are being talked about, but most railroad companies are still too poor to purchase the rolling stock which they so badly need. Quotations are unchanged, at 1.75¢ @ 1.80¢, half-extras, f.o.b. Chicago, for mill lots of Common Iron, but the Ohio and Pittsburgh manufacturers are now endeavoring to establish a rate f.o.b. mill, as they are apprehensive of an advance in railroad freights. Small lots of Common Iron are quoted at 2¢ from store, with 1.90¢ @ 1.95¢, asked, for carloads.

Structural Iron.—Very little new business is reported. Mill lots of Angles are quoted at 2.20¢ @ 2.25¢, f.o.b. Chicago; Universal Plates, 2.25¢; Tees, 2.55¢ @ $2.65; Beams and Channels, 3.40¢. From store, Angles are quoted at 2.35¢ @ 2.50¢; Tees, 2.60¢ @ 2.75¢; Beams, 3.80¢.

Plates, Tubes, &c.—While a very fair volume of business is in progress, trade is somewhat disappointing, as it had been supposed that the excellent demand of August and September would develop this month into decided briskness. No change in store prices has been made that would affect quotations, but an upward tendency is indicated by the higher rates now being asked on large lots. Tubes are firmer, although some manufacturers have not advanced their discount to the rate named by the majority. Quotations from store are as follows: Heavy Sheets, Nos. 10 to 14, 2.65¢ @ 2.70¢; Tank Iron, 2.55¢; Tank Steel, 2.80¢; Shell Iron, 3¢; Shell Steel, 3.25¢; Flange Iron and Steel, 4¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢; Boiler Tubes, 62½ % off.

Sheet Iron.—The scarcity is as marked as ever, buyers finding great difficulty in picking up even a single bundle from the jobbing houses. Jobbers need all they are now receiving from the mills to fill orders taken some time since. The manufacturers are harassed as they have seldom been by urgent appeals to make more prompt deliveries. Few of them are now making quotations, their full capacity being engaged to the end of the year. Jobbers' quotations from store are still 3.20¢ for No. 24, 3.30¢ for Nos. 25 and 26, and 3.40¢ for No. 27.

Galvanized Iron.—Large as the demand was last year at this time, it is greatly exceeded by the activity now prevailing. No one cause seems to be responsible for the improved condition of trade, but all classes of consumers except the cornicemen have increased their purchases. The dealers have had much difficulty recently in supplying orders from stock, often being unable to furnish the particular gauge desired. Prices are firmly maintained, small lots being quoted at 60 % off for Juniata, and 60 % and 5 % off for Charcoal.

Merchant Steel.—Business continues quiet, the few large consumers who have not yet placed their season contracts being evidently inclined to wait either until after the election or toward the close of the year. Combination prices are unchanged, as follows: Bessemer Bars, 2.30¢ @ 2.40¢; Tool Steel, 8½¢ @ 9½¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.40¢; Open-Hearth Spring, 2.90¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 10¢.

Steel Rails.—Actual business still appears to be confined to small lots, but enough inquiries for large quantities are in the market to make manufacturers feel hopeful of a much better condition of trade shortly. Some of the leading railroad companies of the Northwest are asking for quotations for next year's delivery, and it is altogether probable that they will have numerous followers as soon as it is known that they have positively closed such contracts. An incentive to such action is the knowledge that manufacturers look forward to higher prices in 1889, although they frankly concede that at present the indications are not in favor of greatly increased business. For fall delivery nominal quotations are $30 @ $31.

Old Rails and Wheels.—Such transactions in Old Iron Rails as have come to light in the past week seem to indicate a return to lower prices. A lot of 800 to 1000 tons was sold by a railroad company in Central Illinois at $24 delivered in the Mahoning Valley, or equivalent to $23 at Chicago, allowing for difference in freight rates. Chicago holders ask $24 @ $24.50 for such lots as they control, and claim that they will not take lower prices, as the supply available at present is very limited. Old Steel Rails are in moderate demand at $19 @ $20 for straight pieces over 3 feet in length and free from Frogs, &c. Old Car Wheels are very quiet, owing to scarcity, a nominal quotation being $20, but it is hardly likely that consumers would pay so much.

Scrap Iron.—But little movement is reported, although inquiries for Wrought are becoming more numerous, and a few sales of Mill and Cast have been made. Stocks are not large in dealers' hands, and they are inclined to ask higher prices, naming the following rates for carefully selected Scrap ₱ ton of 2000 lb: No. 1 Forge or Railroad Shop, $20.50 @ $21; Track, $19.50 @ $20; No. 1 Mill, $16; Pipes and Tank, $13; Light Wrought, $10; Horseshoes, $19.50; Axles, $26; Cast Machinery, $14.50 @ $15; Stove Plate, $11; Cast Borings, $9; Wrought Turnings, $12; Axle Turnings, $14; Coil Steel, $15; Leaf Steel, $16 @ $17; Locomotive Tires, $16 @ $16.50; for Mixed Country Scrap dealers offer $13.50 @ $14.

Hardware.—Jobbers of Heavy Hardware report business in a very satisfactory condition, prices being pretty well sustained, the demand large and constantly growing for Iron, Steel, Carriage and Wagon stock, Farriers' Supplies, &c., and collections good. In Shelf Hardware a decided improvement is noted over the previous week, all classes of building materials being in active demand, as well as House-Furnishing Goods and small wares generally. In Stamped Tinware prices have been advanced to 70 % and 70 % and 10 % off. Screws are also manifesting a decided upward tendency. No special changes worthy of note have occurred in other lines.

Nails.—Few sales of large lots are reported either of Cut or Wire Nails. The heavy stocks laid in by Missouri River jobbers during the railroad war last spring are not yet entirely exhausted, and in this immediate vicinity the consumptive demand has not for some time been sufficiently strong to require continued renewal of stocks by jobbers. The demand is so slow, in fact, that specifications are being withheld by parties who had more contracts when Steel Nails were selling at $1.75 at factory. Another advance in Wire Nails is expected soon, but in Cut Nails everything waits on the result of the attempt to form a combination of the manufacturers. Steel Cut Nails are still quoted at $2.05 @ $2.10 for carloads, and $2.15 for small lots, but manufacturers' prices are being cut to some extent, so that the market cannot be called firm. Wire Nails continue firm at $2.60 for small lots.

Barb Wire.—Business is distressingly dull, and the condition of trade is not made any better by offers of Barb Wire at prices evidently dictated by financial necessity. Manufacturers and jobbers are endeavoring to get 2.90¢ for Painted and 3.65¢ for Galvanized in a regular way. The abandonment of the latest effort to harmonize the views of manufacturers precipitates a struggle for existence which must soon thin their numbers considerably, if trade does not improve sufficiently to sustain an advance.

Pig Lead.—Small quantities have been sold at 5¢ @ 5.05¢, but consumers have secured considerable stock at slightly lower prices and now claim to be well supplied for the future.

Charles Himrod & Co., 115 Dearborn street, have been appointed sales agents for the Jackson Iron Company, who have started up the Huron Furnace, at Jackson, Ohio, and will turn out a superior grade of Soft Pig Irons.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St. {
PHILADELPHIA, Pa., October 9, 1888. {

Pig Iron.—There is no perceptible change since last week, the tone of the market being steady and firm. It seems unnecessary to go over the ground again, as the conditions are precisely the same as last week. There is no scarcity of business at the inside figure, and no scarcity of Iron at the outside rates. Furnaces are well supplied with orders, and consumers have covered their anticipated requirements well on to the close of the year, so that for the present there is no urgent necessity either to buy or sell. The probabilities are, that there will be a "stand-off" until after the election, and then it is expected that the movement will be a lively one in case the Republican party wins. In the other event, business may possibly fall into a rut similar to that experienced during the first seven or eight months of the year, although there is a great deal of work which cannot well be postponed, no matter who is elected. Cars, for instance, are badly wanted by many roads, and it is thought that shipbuilding will be actively prosecuted during the next 12 months; and, besides that, the country is making progress in every direction, so that the increase of population and the increase in wealth must necessarily create a demand for manufactures of all kinds. As regards Pig Iron, an additional reason for its firmness is said to be the scarcity of good Ores, and the tendency of all materials to a higher range of cost. Of course it is impossible to make predictions with much confidence until after the elections, but there is an undertone of strength and expectancy, which under favorable conditions might start things on a run, but in the meantime there is a disposition to wait developments, feeling that under any circumstances prices are by no means high, and not likely to hurt legitimate dealers who confine their operations within their usual time limits. Sales during the week have been on the basis of $16 @ $16.50 at tide for standard brands of Gray Forge, $17.50 @ $18 for No. 2 Foundry and $18.50 @ $19 for No. 1, with the usual premium on strictly choice and favorite brands. We note a sale of 2000 tons of Pulaski Gray Forge at a sum equal to $16.50, Philadelphia.

Blooms.—There is a good deal of inquiry, but buyers have not responded to the demand for higher prices, as might have been expected. Sales within limits as follows: Nail Slabs, $29 @ $29.50, at mill; Billets from $32 to $36, according to analysis; Charcoal Blooms, $52 @ $54; Run-out Anthracite $42 @ $44; Scrap Blooms, $33 @ $35 ₱ "bloom" ton of 2464 lb. Foreign at tide, c.i.f., duty paid, $29.50 @ $30.50 for Nail Slabs; $34 @ $36 for 4 x 4 Billets, and $35 @ $39 for Siemens-Martin, price according to analysis, &c.

Muck Bars.—The scarcity continues, and prices again show a slight advance on last week's quotations. Asking rates are $29.50 @ $30, delivered, with sales reported at the first-named figure, and also at $29 at mill.

Bar Iron.—No great amount of business has been placed during the past week, but mills have so much work on their books that they are not in a position to take much more for early delivery. There is a good deal of inquiry, however, and it seems more than likely that when the present orders are worked off there will be plenty more to replace them. The advance noted last week has been fully maintained, and the feeling is one of great firmness all the way through the list. Skelp Iron is still wanted in large lots and several lots have been taken at 1.95¢, although 2¢ is now the general asking price, which would probably be paid for prompt deliveries. Bars range from 1.85¢ to 2¢, according to delivery, quantity and requirements as to quality, the entire market having a steady and firm appearance.

Plate and Tank Iron.—There is a fair demand for Plates of every description, but there is no unusual pressure, although mills are running full on orders for early delivery. There is work in prospect which may bring in large orders in course of a few weeks, but in the meantime mills have plenty to go on with and are likely to be in good shape during the balance of the year. Prices about as quoted last week: Ordinary Plate and Tank Iron, 2.05¢ @ 2.15¢; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.3¢ @ 2.4¢; Shell, 2.7¢; Flange, 3¢ @ 3¼¢; Fire-Box, 3½¢ @ 4½¢.

Structural Iron.—There is a good deal of inquiry for bridge material, and although there is no special urgency in the demand, the outlook is thought to be very encouraging. The mills are somewhat pressed for early deliveries, and specifications on old contracts are being hurried forward. Prices same as last week, viz.: 2.10¢ @ 2.15¢ for Bridge Plate; 2¢ @ 2.10¢ for Angles; 2.6¢ @ 2.7¢ for Tees, and 3.3¢ for Beams and Channels, Iron or Steel.

Sheet Iron.—The demand is well maintained, but prices have not reponded to the increased activity. Small lots command the following prices for the best makes:

Best Refined, Nos. 26, 27 and 28	3¼ @ 3½¢
Best Refined, Nos. 18 to 25	3 @ 3¼¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28	4½ @ 4¾¢
Best Bloom Sheets, Nos. 22 to 25	4 @ 4¼¢
Best Bloom Sheets, Nos. 16 to 21	3½ @ 3¾¢
Blue Annealed	2.8 @ 3 ¢
Best Bloom, Galvanized, discount	62½ %
Common, discount	67½ %

Merchant Steel.—There is a fair demand at prices quoted herewith—viz.: Tool Steel, 8½¢; Machinery, 2.6¢; Crucible Spring, 4½¢; Open-Hearth Ordinary Spring, 2.7¢ @ 2.9¢; Crucible Machinery, 5¢; Best Sheet Steel, 10¢; Ordinary Sheet, 8¢.

Steel Rails.—The demand is not important, and orders for this year's delivery are readily placed at $29 @ $29.50, according to quantity, &c. There is some inquiry for spring delivery, but sellers are a little undecided in regard to quotations, although $30 would probably be shaded on a desirable class of business.

Old Rails.—There is nothing doing in this market, although there are buyers at $23 and sellers at $24 for foreign shipments. No sales of spot lots, but $25 has been paid for deliveries at mills in the interior.

Scrap Iron.—There is a fair movement, and sales are readily made at about the following quotations: $21 @ $21.50 for cargo lots; $21.50 @ $22.50 for carload lots, delivered, or for choice $23; No. 2 do., $14 @ $15; Turnings, $13 @ $14; Old Steel Rails, $20 @ $21; Cast Scrap, $15 @ $16; do. Borings, $9 @ $10; Old Fish Plates, $25 @ $26. Old Car-Wheels, $17 @ $18, Philadelphia, or its equivalent.

Wrought-Iron Pipe.—Mills are filled with orders well up to the end of the year. Prices are firm, and Pipe is very scarce. Discounts are quoted as follows: Black Butt Welded, 52½ %; Galvanized do., 42½ %; Black Lap Welded, 62½ %; Galvanized do, 52½ %; Boiler tubes 60 %.

Nails.—The demand is very disappointing, and the feeling in the trade is one of great depression. Prices are nominally from $1.95 to $2 from store, but quotations are very irregular, and depend very much upon circumstances in each individual case.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., {
PITTSBURGH, October 8, 1888. {

The general Iron situation continues in a fairly satisfactory condition. There is no falling off in the volume of business notwithstanding the near approach of the Presidential election, but there is continued complaint in regard to prices. There is a very large volume of business in the aggregate. This is evident from the fact that nearly all the mills and furnaces are in operation, and some of the former are being worked up to their full capacity. Never before, possibly, was there a larger output of Iron and Steel in this district than at present, and but for the closeness in prices there would be no room for complaint. River navigation has again been resumed, an important matter for our manufacturers, who are very much interested in cheap transportation. The placing of an order here or elsewhere often hinges upon transportation, and rates by river are always less than by rail. Finished Iron is often shipped from Pittsburgh to St. Louis, a distance of about 1200 miles, for 10¢ @ 12½¢ per 100 lbs., whereas the rate by rail is nearly double. The Fifth Avenue Cable Road will be opened up for business this week, and the Penn Avenue Cable Road will, it is expected, be ready for business about the 1st of December. Pittsburgh can also boast of two electric street railroads, one of which is said to be the best built and equipped road of the kind in the country.

Pig Iron.—There has been an increased volume of business during the past week, and while there has been no advance in price, the market is firmer. Consumers generally appear to have arrived at the conclusion that there is not much risk in buying at present prices, and that some of them are apprehensive of an advance is evident from the fact that they are anticipating future wants. Included in the sales reported was one of 4000 tons for future delivery. The market is firmer than it was a couple of weeks ago, and furnacemen who were then disposed to make additional contracts are now indifferent. Consumers, now that they can see no prospect of any immediate reaction, are inclined to keep up their stocks of the raw article, while furnacemen, with very few exceptions, are pretty well sold up. Some of them have contracts enough booked to keep them busy for several months to come. However, while the market has steadied up there is no indication of any immediate advance; in a word, the feeling generally obtains that the market will continue to rule fairly active and steady at about present prices. We quote as follows:

Neutral Gray Forge	$15.75 @ $16.50,	cash.
All Ore Mill	17.00 @ 17.50,	"
White and Mottled	15.00 @ 15.50	"
No. 1 Foundry	18.00 @ 18.50,	"
No. 2 Foundry	17.00 @ 17.50,	"
No. 3 Foundry	16.00 @ 16.50	"
No. 1 Charcoal Foundry	23.50 @ 24.00,	"
Cold Blast Charcoal	25.00 @ 28.00,	"
Bessemer Iron	18.00 @	"

Included in the sale reported was 1500 tons Gray Forge at $16.50, cash, and 4000 tons Bessemer at $18, cash.

Muck Bar.—There is more doing, but no change in prices; sales 1500 tons at $29, cash. A novel transaction was reported which hinges upon the result of the Presidential election: 1000 tons for November delivery, the price for which is to be $31.50, cash, if the Republicans are successful, whereas, if Cleveland is re elected, it is to be $29.50, cash.

Ferromanganese and Spiegel.—Sales of 80 % Ferromanganese at $56 @ $56.50, cash, and Speigel at $28 @ $28.50, cash.

Manufactured Iron.—There is a continued steady demand for all kinds of Merchant Iron, Sheet in particular, which is always active at this season of the year, when it is wanted for Stove Pipes, and prices are a shade higher. We continue to quote Bars at 1.80¢ @ 1.85¢; Plate, 2.20 @ 2.25¢; No. 24 Sheet, 2.85¢ @ 2.95¢; Skelp Iron, 1.85¢ @ 1.90¢ for Grooved, and 2.10¢ @ 2.12¢ for Sheared. The mills making a specialty of Pipe are reported quite busy—as having all they can do.

Nails.—There is no improvement in the demand for Nails, nor can it be expected at this season of the year. So far as Pittsburgh is concerned this has been a very poor year. In addition to a very light demand, prices have been unsatisfactory; while it is true that full card rates are being realized, it is also true that they afford little or no margin for profit. Pittsburgh manufacturers are stiff at full card rates and indifferent then, claiming that full card rates afford little or no margin for profit. We continue to quote at $1.90, 60 days, 2 ¢ off for cash.

Wrought-Iron Pipe.—There is a continued good demand, especially for small sizes. Mills are all busy and prices firm but unchanged. Discounts on Black Butt-Welded, 55 ¢; on Galvanized do., 50 ¢; on Black Lap-Welded, 65 ¢; on Galvanized do., 55 ¢; Boiler Tubes, 62½ ¢ off; 2-inch Tubing, 13¢ ℔ foot net; 5⅝-inch Casing, 40¢ ℔ foot.

Old Rails.—There is more inquiry, and while the market is firmer prices remain unchanged. We can report a sale of 3000 tons American Tees at $25.25, and 1000 tons Foreign Double-Heads at $26, cash. As some buyers are buying for future requirements it is evident that they do not anticipate lower prices.

Billets, &c.—We can report sales of Bessemer Steel Billets at $29, cash, delivered on cars at makers' works, and Nail Slabs at same price. Sales of Crop and Bloom Ends at $18.50 @ $19, cash.

Steel Rails.—Heavy sections are quoted at $29.50 @ $30, cash, on cars at mill here.

Merchant Steel.—There is a fair business; no change in prices, Best Brands Tool Steel, 8½¢; Crucible Spring, 4½¢; Crucible Machinery, 5¢; Open Hearth ditto, 2¾¢.

Old Material.—There is a fair demand, but no change in prices. No. 1 Wrought Scrap, $21, net ton; Car Axles, $26 @ $27; Wrought Turnings, $14.50 @ $15; Cast Scrap, $16, gross; Cast Borings, $12.50 @ $13, gross; Car Wheels, $20, gross.

Cleveland.

CLEVELAND, October 8, 1888.

Iron Ore.—Very much to the surprise of the purchasers of Ore, transportation rates have declined several points during the past week. The partial failure of crops in the Northwest is responsible for this hitherto unknown occurrence. Vessel rates had been steadily climbing upward for the past month, and the Ashland and Two Harbors rate seemed likely to reach $2.25 ℔ ton. Owing, however, to the limited amount of grain offered for shipment at Duluth, many new vessels have asked for business at Ashland, Marquette and Escanaba. As a result charters are reported to-day at $1.30 from Escanaba to lower lake ports, $1.50 from Marquette and $1.65 from Ashland and Two Harbors. This reduction in the cost of bringing Ore to the furnaces finds expression in a slightly easier feeling as to prices. While the general range of quotations cannot be changed, it is known that the inside figures given in the list below very closely represent the prices at which Ores have been sold during the past week. The amount of business done has not been large owing to the fact that the best Bessemers are very closely sold up. The season's shipments are close up to 3,400,000 tons, and seem likely to slightly exceed 3,750,000 tons. This, however, does not fairly represent the business for the year, which opened with 700,000 tons of Ore on the docks at lower lake ports. This has gone into consumption, and there is little likelihood of the season's closing with any substantial quantities of unsold Ore on dock. Quotations, f.o.b. cars lower lake ports, are as follows:

No. 1 Specular and Magnetic Bessemer Ore	$6.00 @ $6.15
No. 1 Specular and Magnetic Non-Bessemer Ore	5.25 @ 5.50
Red Hematite Bessemer Ore	5.00 @ 5.25
Red Hematite Non-Bessemer Ore	4.10 @ 4.40
Menominee Range Bessemer Ore	5.15 @ 5.50
Menominee Range Non-Bessemer Ore	4.00 @ 4.25
Gogebic Range Bessemer Ore	5.25 @ 5.50

Pig Iron.—The market retains all its healthy conditions. A large amount of Iron is being sold at very firm prices, the tendency being toward advances all around. Sellers are, quite sensibly, not attempting to force prices, preferring instead a steady market at quotations admitted to be fair to all concerned. Buyers seem to be anticipating an advance, for many purchases largely in excess of immediate wants are reported. Mill and Foundry Irons are particularly strong. The following are cash quotations:

Nos. 1 to 6 Lake Superior Charcoal	$20.50 @ $21.50
No. 1 Strong Foundry, Bessemer quality, ℔ ton	18.20 @ 19.00
No. 1 Strong Foundry, ℔ ton	17.70 @ 18.30
No. 2 Strong Foundry, ℔ ton	16.70 @ 17.30
No. 1 American Scotch, ℔ ton	18.25 @ 18.70
No. 2 American Scotch, ℔ ton	17.20 @ 17.70
No. 1 Soft Silvery, ℔ ton	18.50 @ 19.00
Mahoning and Shenango Valley Neutral Mill Irons, ℔ ton	16.50 @ 17.00
Mahoning and Shenango Valley Red Short Mills, ℔ ton	17.50 @ 18.00

Manufactured Iron.—Common Bar at 1.70¢ is selling freely, and Sheets are in good demand at slightly advanced rates.

Scrap Iron.—Old Americans are weak and it seems improbable that the $25 ℔ ton rate can be much longer maintained. No. 1 Wrought is bringing $19 @ $19.50.

Detroit.

WILLIAM F. JARVIS & CO., under date of October 8, report as follows: Nothing of a startling nature has occurred since our report of a week ago. The volume of business has been somewhat larger and several good sized orders for Lake Superior Charcoal Iron have been booked. Most buyers have ceased to expect former quotations, but are willing to place orders at present prices for future delivery. However, very few furnacemen desire to sell for delivery after January 1st unless at an advance. The demand for high numbers of L. S. Charcoal continues, and Old Wheels are hard to secure at reasonable figures. Consumers are asking that deliveries on orders already placed be hastened, thus showing that they are using faster than was expected. For the present we quote as follows:

Lake Superior Charcoal, all numbers	$20.00 @ $20.50
Lake Superior Coke, all ore	19.75 @ 20.25
Lake Superior Coke, cinder mixed	18.50 @ 19.00
Standard Ohio Black Band	19.75 @ 20.25
Southern No. 1	17.75 @ 18.25
Southern Gray Forge	16.25 @ 16.75
Southern Silvery	17.00 @ 17.50
Jackson County (Ohio) Silvery	18.50 @ 19.00
Old Wheels	20.50 @ 21.50

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts.,
CINCINNATI, October 8, 1888.

Pig Iron.—The market here for Pig Iron during the past week has been quiet—that is, the volume of business has been only moderate, but there has been an active inquiry from large as well as small buyers. Most buyers, however, have made propositions based upon the outcome of the Presidential election, which sellers have been unwilling to admit. In fact, "ifs" and "ans" have been the prominent features in the business transacted. On the 1st of October the new nomenclature of Southern Coke Iron, to conform to the grading by Northern furnaces, went into effect. A firm tone has prevailed here for all kinds and grades of Iron, but changes in prices have been few and unimportant. A few 1000-ton orders of Foundry Iron have been placed, but the majority of sales during the week were small. The following are the approximate quotations for the local market, cash, f.o.b. Cincinnati:

Hot-Blast Foundry.

Southern Coke, No. 1	$17.50 @ $18.50
Southern Coke, No. 2	16.50 @ 17.50
Southern Coke, No. 3	15.50 @ 16.00
Ohio Soft Stone Coal, No. 1	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2	15.50 @ 16.00
Mahoning and Shenango Valley	17.50 @ 18.50
Hanging Rock Charcoal, No. 1	20.50 @ 22.50
Hanging Rock Charcoal, No. 2	19.50 @ 22.00
Tennessee and Alabama Charcoal, No. 1	18.50 @ 19.50
Tennessee and Alabama Charcoal, No. 2	17.00 @ 18.00

Forge.

Strong Neutral Coke	14.75 @ 15.25
Mottled Neutral Coke	13.75 @ 14.00
Gray Forge	14.50 @ 14.75

Car-Wheel and Malleable Irons.

Southern Car-Wheel	20.00 @ 23.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	20.50 @ 21.50

Nails.—There has been a fair volume of business without change of importance in prices. Jobbing prices are based upon 12d @ 40d, which sell at $2.10 ℔ keg, with 10¢ rebate in carload lots, at mills. Steel Nails sell at $2.10 and Steel Wire Nails at $2.75 ℔ keg.

Manufactured Iron.—There has been a firm tone prevailing, with some advance realized on special kinds, with a good demand for Bar, Sheet and Structural Iron. Common Bar Iron, 1.90¢; Charcoal Bar Iron, 2.90¢ @ 3¢; Sheet Iron, Boiled, Nos. 10 to 27, 2.50¢ @ 3.25¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3½¢ @ 4½¢ ℔ lb.

Old Material.—There has been a moderate demand and an easier market for Old Rails, with moderate sales at $23, cash, but there has been little call for Old Wheels, and prices are nominal at $19.50, cash, here.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,
CHATTANOOGA, October 8, 1888.

There is no change in the movements of general trade. Matters have assumed their usual conditions, and the late scare is practically a thing of the past. The volume of business is assuming larger proportions as the fall advances. The railroad depots are crowded with merchandise, the streets are filled with drays, and the season of activity is now fully upon us. A very noticeable feature of the business that is now being done on Southern railroads, compared to what was being done 15 or 20 years ago, is the difference in the character of the freight now to what it was then. Then whole trains of cars were loaded with cotton; now the preponderence is the products of the mines and furnaces. It is not an unusual thing now to see train after train going along with nothing but coal, coke, Ore or Pig Iron, while only occasionly a train of cotton bales; and there is also this difference: the former continues the year round, while the latter occurs only late in the fall and during early winter.

Pig Iron.—The last report practically covers the situation at present, with the

difference perhaps that there is a slight falling off in the stiffness that has prevailed during the past month or two. Sales continue to be made at past figures, but are confined more to smaller lots than heretofore, while the speculative feeling has nearly subsided. Still, the furnaces are having no trouble at all in placing their entire output. The demand from Southern consumers is assuming greater activity than ever, which shows a very healthy condition of affairs. The manufacture of Sorghum Mills is now getting to be a very large item, and many carloads are being sent through the Northwest and points in the distant West and Southwest. The rules of regrading that have lately been established by the Southern furnaces have acted as a disturbing element among many Northern agents, who heretofore have been selling Southern No. 2 as No. 1, and so billing it. In fact, the system of Southern grading operated a good deal like the magician's bottle, from which whisky, wine or brandy could be had at will. If a consumer wanted No. 1, he got it; if he wanted No. 2 he got it, but got it all out of the same pile. All the furnaces that have been relined and otherwise repaired are now turning out about 10 % more than they have ever done before, and also a much better article. The new furnaces are also working up to the satisfaction of their owners.

Louisville.

LOUISVILLE, KY., October 8, 1888.

The market has been quiet during the past week, and but few sales have been made. Prices are firm. Buyers have been compelled to pay the last advance. The tendency is slightly upward, and there is a disposition among furnacemen to ask a slight advance. If a buying movement should set in this would be easily obtained. Old Rails remain firm at $24, Wheels at $21.

Southern Coke, No. 1 Foundry	$17.00 @ $18.00
" No. 2 "	16.00 @ 16.50
" No. 2½ "	15.50 @ 16.00
Hanging Rock Coke, No. 1 Foundry	17.25 @ 17.75
Hanging Rock Charcoal, No. 1 Foundry	21.00 @ 23.25
Southern Charcoal, No. 1 Foundry	18.00 @ 18.50
Silver Gray, different grades	14.50 @ 15.25
Southern Coke, No. 1 Mill, Neutral	14.75 @ 15.25
" No. 2 " "	13.75 @ 14.75
" No. 1 " Cold Short	14.25 @ 14.75
" Charcoal, No. 1 Mill	15.75 @ 16.50
White and Mottled, different grades	13.50 @ 13.75
Southern Car-Wheel, standard brands	23.00 @ 24.00
Southern Car-Wheel, other brands	19.25 @ 21.25
Hanging Rock, Cold Blast	22.25 @ 25.25
Hanging Rock, Warm Blast	19.25 @ 20.25

New York.

Office of *The Iron Age*, 66 and 68 Duane street,
NEW YORK, October 10, 1888.

American Pig.—The market is steady and firm, and in some instances more money is asked and obtained for special or fancy brands of No 1 Foundry, which fetch from $18.50 to $19. Standard Irons, however, are still to be had at the old prices, at which the Thomas Iron Company are still selling. The latter have placed about 5000 to 6000 tons during the week. We are informed that the company have still Iron to sell. This is due to the fact that early in the year—in fact up to May—their customers were not taking their usual quantity, delaying and deferring deliveries, so that, coupled with a heavier output, the company have more Iron than usual to sell so late in the season. So long as these leading producers continue in the attitude of selling at old figures a general advance in the territory tributary to this market is not looked forward to. We quote: Standard to Choice No. 1, $18 @ $19; No. 2 Foundry, $17 @ $17.50, and Gray Forge, nominally, $16 @ $16.50.

Scotch Pig.—The market is quiet; with prices as high as they are now, it is a matter of some surprise that Eastern foundries do not follow the practice of their Western brethern of using more liberally high Silicon Irons, like the Norton in Kentucky and the Winona and Bessie in the Hocking Valley. We quote: Coltness, $21.75 @ $22, nominally; Shotts, $20.75 @ $21; Langloan, $21, and Dalmellington, $20.50, nominally.

Spiegeleisen and Ferromanganese.—We hear reports of sales of Spiegeleisen, principally 20 %, to Eastern and Western mills to the extent of upward of 5000 tons for forward delivery at about $27, which remains the quotation. In Ferromanganese no business has been reported. It is stated that the foreign makers of Ferromanganese have formed a combination to hold up prices, but the accuracy of the report is questioned by importers, who claim that the rise is due to scarcity of Ore and high freights, and that any effort to control prices would have to rest first on the control of the Russian and Chili Ore deposits. We quote $55 @ $56 at tide for 80 %.

Plates.—We quote Iron Tank, 2.1¢ @ 2.2¢; Shell, 2.3¢ @ 2.4¢; Steel Tank, 2.2¢ @ 2.3¢; Shell, 2.4¢ @ 2.5¢; Flange, 2.65¢ @ 2.75¢, and Fire-box, 3.5¢ @ 4¢.

Structural Iron.—We quote Sheared Plates, 2¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.2¢; Angles, 2.1¢ @ 2.15¢; Tees, 2.5¢ @ 2.6¢, and Channels and Beams, 3.3¢.

Steel Rails.—Two sales aggregating 12,000 tons are reported by two Eastern mills, the larger for a New England road, and the other for a railroad in Western New York. The latter is of special interest, because it represents one of a series of transactions brought out by the conjunction of high prices for old Iron Rails and low prices for new Steel Rails. The difference between the figures realized and paid was probably not more than $5, inclusive of freights, so that the entire cost of relaying with steel is represented by that difference and by the cost of taking up old Iron and putting in new Steel. We understand that in this case the Iron Rails were still good for considerable service. The New England order, referred to in the above, was for winter and spring delivery, and is said to have been sharply competed for. We quote for winter deliver $28 @ $28.50, with rumors of sales at lower figures. We note, also, a sale of 3000 tons to a Southern road. There has been an increase of 200,000 tons in the 1888 allotment.

Wire Rods.—There have not been any sales of any consequence. An inquiry for the Pittsburgh district is in the market, but it is considered probable that it will go to a domestic mill We quote for early shipment $39.50 @ $40.

Old Rails.—The market is weaker, Tees being offered at $23.50, while the best bids are not above $23. Business has been rendered impossible by the wide divergence in buyers' and sellers' views, and the offerings of Southern roads, two blocks, aggregating about 5000 tons, being available, have made buyers recover confidence. Considerable Old Rails have come into the market in exchange for New Rails. Thus we are told that one firm of brokers in Pittsburgh have negotiated sales of this character, aggregating fully 10,000 tons. The last of the kind mentioned is that of a road in this State who have sold 3000 tons of special quality Old Rails, still serviceable, at $24, on line of road, and have purchased 4000 tons of New Steel Rails. Upon inquiry, we find that the difference in price between Old Rails and Muck Bar, which is considered to represent the limit where it is unprofitable to use Old Rails, and where it pays to use Muck Bars, is about $4 per ton. In other words, unless Old Rails are $4 cheaper than Muck Bars, the latter are preferable. Foreign Tees are offered at $23.50.

Fastenings.—We quote Spikes $2.25 and Angle Bars 2.05¢ @ 2.10¢.

Cotton Ties.—Contrary to expectation, the demand has become more active, the season being late this year. We quote $1.10 @ 1.12 ℔ bundle, New Orleans delivery.

Financial.

A severe reaction in the wheat market and a corresponding decline in breadstuffs indicate a radical change in the tone of speculation. Prices of wheat have fallen off 11¢ in two days, in a steady decline, with heavy selling orders—December weak at $1.12. Provisions were lower, pork breaking badly on selling orders from Chicago, and lard was decidedly weak. In coffee there was a sharp advance. Cotton is dull. Raw sugars are depressed.

Nearly all markets have felt the disturbing influence of the wheat deal initiated by Chicago operators, prices for various commodities having been forced up to abnormal figures, endangering the stability of prominent mercantile firms, checking the export movement and exciting more or less apprehension concerning the future of the money market; but the concensus of opinion points to comparative ease in the immediate future. It is agreed that although the yield of wheat is below expectation, the better prices realized, together with the avails of an unprecedented corn crop, now estimated by good authorities as high as 2,210,000,000 bushels, will go far to compensate for the apparent loss. A source of satisfaction, as regards the present situation, is the settlement of most of the differences growing out of the Chicago deal without serious disaster. Taking all in all, the commercial outlook is improved. The Southern scourge is less threatening. In New York, among dry goods and grocery jobbers, with the present demand continuing, the prospects are pronounced exceedingly favorable for the remaining months of the year. Collections, aside from some delay in the South, are made with promptness. Railroads are having a remunerative traffic. The window-glass industry, employing 10,000 men, is again in full blast. The coal trade is still booming, excepting as some falling off in consumption is noticed among the iron manufacturers. Respecting the Sugar Trust, action has been taken in the Supreme Court to annul the charter of the leading refining company, upon the allegation that the combination is a criminal conspiracy under the laws of the State. On the canal, as a result of the wheat corner, the average freight rate on cereals is the lowest for any September on record, and on the lakes the lowest, with two exceptions, in 11 years.

The Stock Exchange market has been comparatively quiet, but irregular. News that the excitement in the wheat market at Chicago was subsiding had a salutary influence. Prices declined on the announcement of an advanced rate by the Bank of England, but soon recovered. On Friday the feature was a rise in New England, based on the prospective importance of the road in coal transportation. On Saturday the market was weak and lower. On Monday orders from London caused firmer prices, and Treasury purchases of bonds operated favorably, but trading was dull. On Tuesday the market was irregular but strong at the close. A special shipment of $500,000 in gold, was regarded as of no significance.

United States bonds are quoted as follows:

U. S. 4½s, 1891, registered	108⅛
U. S. 4½s, 1891, coupon	108⅛
U. S. 4s, 1907, registered	129
U. S. 4s, 1907, coupon	129
U. S. currency 6s	121

The weekly bank statement showed a decrease of $3,339,675 in surplus revenue, which now stands at $11,417,500, against $8,112,770 at the corresponding date last year. The special feature was the large increase in the amount of loans, equal to $4,929,100, which is due partly to improvement in general trade but mainly to speculative activity in grain. Specie decreased $423,200; the legal tenders are down $1,904,600, the deposits other than United States increased $4,047,900. A continued heavy demand for funds in the interior was offset to a large extent by purchases of bonds by the Treasury. Monday's bond purchases, aggregating $3,783,100, made up the full requirement for the sinking fund, about $48,000,000. The Secretary on Tuesday accepted an additional $7,174,350. All purchases since June 30 have been applied to this purpose. Purchases from now on will be optional with the secretary, but there is reason to believe that he will pursue a liberal policy, and that undue stringency while the fall trade is in progress will be obviated. During the month of August the quotations for 4 per cents varied from 127½ to 128¾, and the average rate of interest realized by purchases is computed at 2.215 %. The 4½ % per cents varied from 107½ to 107¾, and the rate of interest realized would average 2.188 %. Time rates for money in this market are quoted 4 @ 5 % for four and six months, but the demand is light. Rates for commercial paper are, for 60 and 90 days, 4¾ @ 5½ %; longer dates 6 @ 7 %. The advance in the Bank of England rate of discount to 5 %—the highest since February last year—induced the leading drawers of sterling exchange to put up the nominal figure for demand bills to $4.89. The posted rates are now $4.84½ and $4.89. The Bank of France advanced its rate to 4½ %. A London dispatch speaks of the probability of a further advance in the Bank of England rate, which, "it is calculated, will cause gold shipments from New York." The London *Times* says that the total shipments to Buenos Ayres will be £3,000,000. The exports of specie from New York during the week were $425,000, and the imports $136,000. The recent advance of about 5 % in the silver market is attributed to simultaneous orders to purchase given by several European governments. A further slight advance would bring silver from India.

Clearing-house returns now are materially increased compared with 1887, for the first time this year. The aggregate for 38 cities shows an increase of 18.9 %; outside of New York the gain is 16.1 %; New York increased 20 %; Boston, 21.3 %; Philadelphia, 7.5 %; Chicago, 39.4 %; St. Louis, 11.9 %; San Francisco, 10.9 %; Baltimore, 9.2 %; Cincinnati, 1.1 %. New Orleans, decrease, 12.5 %; St. Paul, 3.3 %; Minneapolis 2.7 %; Memphis, 19.3 %, and Wichita, 22.7 %.

The imports of merchandise at this port during the week were valued at $7,811,178, of which $2,000,000 represent dry goods. Since January 1 the total is $359,952,000, as compared with $363.030,000 for the same time last year. The exports were $5,887,711.

The American Bankers' Association, which has a membership of 1700, held its annual convention in Cincinnati last week, Logan C. Murray, of New York, delivering the annual address. Charles Parton, of St. Louis, was elected president and John J. Knox is chairman of the Executive Committee.

Imports.

The imports of Iron and Steel, Hardware, &c., at this port from October 1 to October 4, inclusive, and from January 1 to October 4, inclusive, were as follows:

Iron and Steel.

	Oct. 1 to Oct. 4. Tons.	Jan. 1 to Oct. 4. Tons.
Pig Iron: R. F. Downing & Co	200	200
Naylor & Co	151	6,315
G. W. Stetson & Co	100	12,865
James Williamson & Co	100	4,400
Crocker Bros	100	9,562
N. S. Bartlett	100	4,500
Spiegeleisen: Dana & Co	500	3,403
Crocker Bros	212	5,095
Geisenheimer & Co	25	250
Steel: W. F. Wagner	30	1,149
J. Abbott & Co	16	464
J. A. Coe	16	16
Chas. Hugill	13	241½
R. H. Wolff & Co	9	441
C. F. Boker	4	189½
Thos. Prosser & Son	2	58
C. W. Power	3	52
Steel Rods: Naylor & Co	286	16,257
S. A. Galpin	250	2,820
R. H. Wolff & Co	162	3,173
J. A. Roebling's Sons	21	1,380
Steel Crop Ends: Naylor & Co.	251	3,190
Steel Forgings: Thos. Prosser & Son	156	3,831½
Steel Wire: M. Cohn & Co	17	17
Steel Slabs: R. F. Downing & Co	30	30
Swedish Iron: Naylor & Co	320	420
H. N. Holt	75	75
J. Abbott & Co	50	6,866½
G. Lundberg	11	599
Iron Rods: Naylor & Co	40	595
Rivet Rods: J. Abbott & Co	201	4,188
R. F. Downing & Co	25	257
G. Lundberg	12	458
Charcoal Iron: Page, Newell & Co	56	172
Sheet Iron: T. B. Coddington & Co	40	1,188
Scrap Iron: J. H. Boothby	80	80
Iron Rings: Thos. Prosser & Son	3	6
Cotton Ties: Bullard & W	450	1,470
Naylor & Co	140	5,077
	Boxes.	Boxes.
Taggers Iron: Phelps, Dodge & Co	105	105

Tin Plates.

	Boxes.	Boxes.
Phelps, Dodge & Co.	21,188	437,842
A. A. Thomsen & Co	10,341	111,426
Dickerson, Van Dusen & Co	6,791	216,357
N. L. Cort & Co	5,575	87,266
G. B. Morewood & Co.	2,155	38,945
Central Stamping Co	1,667	26,979
R. Crooks & Co	1,589	56,123
T. B. Coddington & Co	1,450	132,399
S. Shepard & Co	1,280	17,598
H. R. Demilt & Co	850	16,361
Pratt Mfg. Co	535	137,457
Lombard, Ayres & Co	500	11,212
Lalance & G. Mfg. Co	411	4,415
Somers Brothers	328	768
E. S Wheeler & Co	275	6,258
Hy. Whittemore & Co	205	44,310
Merchant & Co	200	18,449
Smith & Lockwood	200	200
Bruce & Cook	92	79,701
C. S. Mersick & Co	50	5,306

Metals.

	Pounds.	Pounds.
Tin: Muller, Schall & Co	392,719	9,276,923
American Metal Company	179,067	2,662,455
Jas. E. Pope, Jr	111,924	326,871
R. Crooks & Co	56,110	526,591
Knauth, Nachod & Kuhne	31,076	74,312
Hendricks Bros	27,498	367,455
D. Thomsen & Co	22,585	204,043
Spelter: Naylor & Co	166,238	472,913
Muller, Schall & Co	111,994	111,994
Lewisohn Bros.	55,115	121,253
Sheet Zinc: Naylor & Co	112,014	212,014
	Casks.	Casks.
Antimony: Hendricks Bros.	34	204

Irons and Metals Warehoused from October 1, to October 4, Inclusive:

	Tons.
Swedish Iron: J. Abbot & Co	100

Hardware, Machinery, &c.

Baldwin Bros., Gun Barrels, cs., 6
Bernard, G., Ironwork, cs., 26
Boker, Hermann & Co., Hdw., pkgs., 49; Nails, cs., 2; Hdw., cs., 17
Borgafeldt, Geo. & Co., Ironware, cs., 2
Corbiere, Fellows & Co., Mch'y., cs., 6
Downing, R. F. & Co., Iron Wheels, 26
Engelhorn, L., Mach'y, cs., 32
Field, Alfred & Co., Arms, cs., 8; Percussion Caps, cs., 7
Hall & Ruckel, Hdw., cse., 1
Hartley & Graham, Arms, cs., 19
Hensel, Bruckman & Co., Mach'y, cse., 1
Inman & I. SS. Co., Nails, cks., 6
Kastor, Ad., Arms, cs., 3
Keydel, Henry & Co., Arms, cs., 13
Korting Gas Engine Co., Mach'y, cs., 10
Lau, J. H. & Co., Arms, cs., 9
Lewis & Conger, Hdw., cs., 4
McCoy & Sanders, Hdw. and Cutlery, cs., 6
Merchants' Despatch Co., Arms, cs., 29
Meacham Arms Co., Arms, cs., 16
Perez, Triano & Co., Mach'y, pcs., 2
Powell & Clement, Arms, cs., 20
Pim, Forwood & Co., Hdw., cs., 15
Schoverling, A., Arms, cs., 50
Shoverling, Daly & Gales, Arms., cs., 22
Simpson, Spence & Young, Mach'y, cs., 5
Thibaud Bros., Machines, bxs., 2
Ward, Asline, Mdse., cs., 4
Wiebusch & Hilger, Arms, cs., 7; Mdse., cs., 8
Order, Mach'y, pkgs., 5; Ironware, cs., 3

Exports of Metals.

	Oct. 1. to Oct. 4. Pounds.	Jan. 1. to Oct. 4. Pounds.
Copper: J. Abbott & Co		11,120,619
Lewisohn Bros		3,929,022
F. A. Lomal		2,581,293
American Metal Company	224,128	5,629,962
G. H. Nichols		223,939
J. Bruce Ismay		112,000
S. Mendel		560,000
Ledoux & Co		110,276
Muller, Schall & Co		430,000
Copper Queen Con. M. Company		224,034
J. Kennedy, Tod & Co		112,026
H. Becker & Co		1,250
Orford C. & S. Rfg. Company		449,881
Robt. M. Thompson		125,000
Thos. J. Pope, Sons & Co		1,277,130
J. Parsons & Co		420,000
Naylor & Co		302,709
Bridgeport Copper Company		112,000
C. Herold		250,000
Phelps Bros		6,250
R. W. Jones		189,984
Ladenburg, Thalmann & Co.		239,371
W. H. Crossman & Bro		4,000
R. Crooks & Co		1,000
Copper Matte: Williams & Terhune		34,382,598
Lewisohn Bros		3,021,610
American Metal Company		2,620,102
J. Abbott & Co		295,000
C. Ledoux & Co		485,800
F. W. J. Hurst		184,288
G. H. Nichols		722,777
H. T. Nichols & Co		180,995
Kunhardt & Co		41,652
Spelter: Muller, Schall & Co.	30,000	30,000
Copper Ore: John H. Starin	28,000	28,000
Old Brass: Burgass & Co	12,071	252,466
	Tons.	Tons
Pig Iron: Peter Wright & Sons	100	480

Coal Market.

The Anthracite Coal trade is marked by the same characteristics noted for some time past. There is an easier tendency for most sizes, but prices generally are firmly held, and a fair business is in progress on the latest schedule basis. Deliveries are pressed actively, mainly in filling former orders, and in the East and interior points there is special anxiety to complete shipment while navigation remains open. Stove Coal is scarce, most of the producers being out of the market. Egg is a little stiffer. Broken and all other manufacturing sizes are easy. Pea and Buckwheat are a drag. Broken is cut a little. Altogether the trade is considered in good condition. Production is still heavy, but, for the week, there is a decrease of about 60,000 tons compared with the previous week, the total being 828,636 tons, but this amount is 100,000 greater than for the corresponding week last year. Since January 1 the aggregate is 28,444,077, an increase of upward of 2,349,000 tons compared with 1887. This extra output goes West, where the demand has been unprecedented. It is estimated that the West this year will take near 2,000,000 tons. Quotations are as follows: Hard White Ash, Broken, $4.15; Egg, $4.40; Stove, $4.65; Chestnut, $4.55; Fine White Ash, Broken, $3.95; Egg, $4.30; Stove, $4.65; Chestnut, $4.55.

The production of Anthracite Coal for the year to October 6 compares with 1887 as follows:

Schuylkill	6,424,833	7,178,603
Lehigh	5,498,008	5,541,144
Wyoming	16,521,236	13,378,487
Total	28,444,077	26,098,234

A large contract was awarded to A. H. Church, of Ashland, by the Reading, to strip the mammoth vein at Mahonoy City Colliery. It will require one year to complete the task. Two million tons of Coal will be secured from it, and the cost will be only about one-third that of mining by the common method.

The New York Brokers' and Freighters' Exchange has been organized to promote

the general freighting interest in the harbor of New York. Officers are: O. C. Hanchett, president; Geo W. Kellam, secretary; Thos. Dennin, treasurer.

Bituminous Coal is active on pool basis of $3.25 f.o.b. The lack of transportation is still a cause of complaint. The growth of the trade is remarkable. Cumberland reports for the year to September 29, 2,653,000 tons, against 2,370,000 tons for the same time in 1887, and Clearfield, 2,528,000 tons, against 2,357,000 in 1887.

Metal Market.

Copper.—At the time of our last week's report, spot Chili Bars were still £96; this morning they are £82 in the London market, while futures declined from £79. 10/ to £77, and good merchantable brands from £78 to £77. 7/6, only Best Selected remaining £82, unaltered since then. The London and Continental bears having been punished, spot Bars have taken range again with other Copper. Here the dealings in Copper have almost come to a complete standstill; yesterday a local dealer sold December to the syndicate at 17½¢; the latter maintains its spot price at 17.75¢. Casting brands are bringing 16¢ with ease. It is reported from Boston that the Calumet and Hecla Stamp Mills produced in 24 hours, ended at noon on Tuesday of last week, 140 tons of mineral, the largest output for one day in the history of the mine, and yielding over 200,000 lb of Fine Copper. The total profit on this one day's output is figured at fully $18,000.

Tin—Has fluctuated but little in London. Spot stood a week ago £101. 15/, and has given way gradually to £100. 17/6 this morning, while futures dropped but slightly, from £101. 15/ to £101. 5/. The trade here has been quite tame, the sales on 'Change being restricted to 60 tons all told, of which 20 prompt shipment at 23¢ yesterday and 10 tons at 23.10¢. The spot price is this morning 23⅛¢, at which the market winds up dull. September shipments from the Straits this way were 756 tons, against 450 last year, and 1300 to England, against 1200; since January 1, respectively, 2200 tons, against 4000 tons, and 13,700 tons, against 10,000 tons. *Tin Plates.*—The market has not been quite as firm as of late; the productive capacity of South Wales is evidently gaining on consumption. The demand here has been very moderate both for spot and futures. Liverpool has given way from 14/ to 13/3 @ 13/6 with Cokes. We have to reduce to-day some of our last week's quotations, they are now as follows for large lines, ⅌ box: Siemens-Martin Steel, Charcoal finish, $5.25 @ $5.75; Coke finish, $4.70; Ternes, $4.25 @ $4.35; Bessemer Cokes, $4.50 @ $4.55, and Wasters, $4.30.

Lead.—The bull speculation in Lead seems to have spent itself for the moment. On 'Change 400 tons changed hands, and 100 tons in the open market, down to 4.90¢, at which the market closes flat. Manufacturers are trying to get along as well as they can without appearing in the market as buyers, the corroders state they need not buy for a month to come to prepare for their spring demand, and the entire situation is devoid of either life or strength. In London Soft Spanish has remained steady at £14. 10/, and English Pig at £14. 15/. The flurry there, while it lasted, we perceive from accounts by mail, was due to buying for American account. St. Louis and Chicago are both 4.90¢.

Spelter.—A moderate consumptive demand has been filled in this city at 5⅛¢ @ ¼¢, Common Domestic, Silesian being held at 6.¢ @ 6.05¢; London giving way from £19. 2/6 to £19 in the meantime.

Antimony.—A fair demand has kept Cookson at 12¾¢ and Hallett at 10⅞¢; the latter is unaltered at £42 in London.

New York Metal Exchange.

The following sales are reported:

THURSDAY, October 4.

16 tons Lead, October	5.00¢
16 tons Lead, October	4.97½¢
32 tons Lead, October	4.87½¢
16 tons Lead, October	4.92½¢
214 tons Lead, October	4.95¢
16 tons Lead, November	4.85¢

FRIDAY, October 5.

48 tons Lead, October	5.05¢
16 tons Lead, October	5.07½¢
16 tons Spelter, spot	5.10¢
10 tons Tin, November	22.95¢

SATURDAY, October 6.

20 tons Tin, prompt shipment	23.00¢
100 tons Lead, spot	5.10¢

MONDAY, October 8.

10 tons Tin, November	23.10¢
32 tons Spelter (prime Western)	5.10¢

TUESDAY, October 9.

100,000 lbs. Lake Copper, December	17.50¢
100 tons Lead, spot	5¢

WEDNESDAY, October 10.

81 tons Lead, October	4.90¢

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, Oct. 10, 1888.

The open market price for Chili Bar Copper for prompt delivery has receded £12 @ £15 during the week, but the lowest "official" price is still considerably above that at which the syndicate have made sales to consumers. The cause of the decline is doubtless the fact that there have been comparatively few "short" sales to cover this month, the "bears" doubtless being satisfied that endeavors to break the market by selling futures entangles themselves only. Consumers are said to have purchased more freely of Chili Bars the past two or three weeks than for some considerable time previous. Where satisfactory guarantee was given that the Copper purchased would go into consumption, the syndicate sold at £78 for prompt or future delivery. It is stated now that 105,000 to 110,000 tons can be located as in the hands of the syndicate. During the past month about 218 tons American Ingot have been added to the stocks in store in England. The report has circulated that the syndicate will cancel recent contracts made on payment of £20 [cable is somewhat obscure on this item.—EDITOR]. There has been a revival of reports to the effect that a new combination is forming to take up the contracts made in the name of the Société des Métaux. It is now stated that an organization known as the Société Civile is practically formed and will relieve the Société des Métaux of its obligations with the various Copper mining companies. There does not appear to be any apprehension that existing contracts will be at all unfavorably affected by the proposed transfer.

The Block-Tin market has been affected in a measure by somewhat adverse statistics, but subsequently recovered, although the demand has shown no material improvement. There is little or no change in the situation from the strictly speculative standpoint.

The demand for Tin Plate has been fairly active. Intending buyers invariably find makers indifferent, owing to the fact that their books are full, and disinclined to take any further orders of any magnitude pending the quarterly meeting, to be held on the 11th inst. The total stock at British shipping points is returned as 191,000 boxes, against 199,750 last month and 236,000 in August. The stock last year was 199,000 boxes. The exports to America during September were 26,000 tons.

Webb, Shakspeare & Williams are adding two new establishments to their works (the Glamorgan), at Pontardulais, and will soon have a total of five mills in operation.

Scotch Pig Iron warrants have continued more or less depressed under the weight of anxiety to realize, quite heavy sales for makers' account and renewal of quite heavy storing. The decline on "warrants" has unfavorably affected the market for makers' brands. Some large sales were made early in the week, but buyers are placing very few orders at the present time. The exports of Pig Iron to the United States last month were 12,000 tons, against 10,000 in August. Prices are somewhat lower on most brands of Scotch, but no further change is reported on Middlesboro' or Bessemer Pig. Spiegeleisen is again higher, on good demand and moderate offerings.

There is no abatement of the activity in the Manufactured Iron branch and prices are very strong all through. The Staffordshire Marked Bar houses have advanced prices 10/ and Common Bars and Black Sheets are about 5/ higher. The demand for nearly all lines of Steel continues brisk, but prices show some irregularity. All late difficulties with workmen have been adjusted. On Rails there has been a partial recovery of last week's decline. Blooms, Billets, Slabs and Wire Rods are held somewhat higher.

Scotch Pig.—The market very irregular, and business smaller than previously:

No. 1 Coltness,	f.o.b.	Glasgow	50/
No. 1 Summerlee,	"	"	51/
No. 1 Gartsherrie,	"	"	47/6
No. 1 Langloan,	"	"	49/
No. 1 Carnbroe,	"	"	43/
No. 1 Shotts,	"	at Leith	48/6
No. 1 Glengarnock,	"	Ardrossan	46/6
No. 1 Dalmellington,	"	"	42/6
No. 1 Eglinton,	"	"	41/6

Steamer freights, Glasgow to New York, 10/ Liverpool to New York, 10/.

Cleveland Pig.—Prices without change but the market rather weak and slow. No. 1 Middlesboro', G.M.B., 37/; No. 3 do., 34/6.

Bessemer Pig.—There has been only a fair demand. Prices show little change. West Coast brands, mixed numbers, 44/6, f.o.b. shipping point.

Spiegeleisen.—Demand has been more active, and a further advance in prices is asked. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—Business is of good volume and prices are firmer. Standard sections quoted at £3. 18/9, f.o.b. at N. W. England shipping point.

Steel Blooms.—The market firm and demand good. We quote £4. 2/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Demand fairly active and the market firm. Bessemer, 2½ x 2½ inch, £4. 2/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—A moderate business, but prices firm. Bessemer, £4. 2/6, f.o.b. at N. W. England shipping point.

Steel Wire Rods.—The demand moderate, but sellers very firm. Mild Steel

No. 6 quoted at £5. 19/6 and No. 5 at £5. 18/6, f.o.b. at N. W. England shipping point.

Old Rails.—Very little doing and prices nominal. Tees held at £3. 2/6, and Double Heads £3. 5/, f.o.b.

Scrap Iron.—A moderate business at previous prices. Heavy Wrought quoted at £2. 5/, f.o.b.

Crop Ends.—The market quiet and unchanged. Bessemer quoted £2. 7/6 @ £2. 10/, f.o.b.

Manufactured Iron.—Market strong and active, with prices 2/6 @ 10/ higher. We quote, f.o.b. Liverpool:

	£ s. d.	£ s. d.
Staff. Ord. Marked Bars....	@	8 2 6
" Common "	@	5 5 0
Staff. Bl'k Sheet, singles	@	7 7 6
Welsh Bars (f.o.b. Wales)...	@	4 17 6

Tin Plate.—Business restricted by wide difference between buyers' and sellers' views. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/6 @ 16/
IC Bessemer steel, Coke finish	14/3 @ 14/6
IC Siemens " " "	14/6 @ 14/9
IC Coke, B. V. grade	14/ @ 14/3
Charcoal Terne, Dean grade	12/6 @ 13/

Tin.—The market has been fairly active. Straits quoted at £101. 5/, spot, and £101. 10/ for three months' futures.

Copper.—Somewhat irregular market. Business moderate. Chili Bars, £78, spot, and £78. 10/ three months' futures. Best Selected, £81.

Lead.—The market quieter and not so firm. Soft Spanish, £14. 10/.

Spelter.—Demand continues good and the market firm. Silesian, ordinary, £19. 2/6.

Foreign Markets.

EQUIVALENTS

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds.
Kilogram	2.205
Picul	134.

EAST INDIES.

SINGAPORE, August 22, 1888.—*Tin.*—Our last report was dated 8th inst., since when prices have fluctuated between $34.87½ and $37.37½, closing with sellers at $35. Sales aggregate 400 tons, and supplies are coming to hand pretty freely. *Gum Copal.*—A small business has been done for the United States at $11.12½ for the best quality. In *Gum Damar* nothing was done in the interval. *Tonnage.*—London rates are steady at 27/6 @ 30/ for weight. For New York via Canal there is no tonnage offering; via the Cape the Tabique will clear shortly, and the Sonntag has commenced loading; rates are unchanged. *Exchange* is steady at 3/1½ for six months' sight credits. The Tin shipments hence, so far in August, have been: Per steamer Waverley to San Francisco, 50 piculs; per steamer Glenartney to New York, 422; per steamer Bonlawers to ditto., 1683, and per ship Hoogly to Boston, 253, making total shipments since January 1 19,348 piculs.—*Gilfillan, Wood & Co.*

SINGAPORE, October 4, 1888.—*Tin.*—The September shipments from the Straits Settlements to the United States have been 750 tons, against 450 in 1887, and to England 1300, against 1200. Since January 1 the shipments have been respectively 2200 tons against 4000, and 13,700 against 10,000.—*Gilfillan, Wood & Co., to Mr. Charles Nordhaus, 89 Water street, New York, per cable direct.*

MANILA, October 1, 1888.—*Hemp.*—Buyers are ready to pay $10.25, against $11 same date last year, ₱ picul, which equals, cost and freight ₱ ton, £33. 17/6, against £38. 17/. The clearances to the United States since last cable amount to 10,000 bales, against 5000 in 1887, and, since January 1, to 147,000, against 159,000. There remain loading for the same destination 37,000 bales, against 56,000; cleared for England since January 1, 252,000, against 161,000; loading for ditto, 13,000, against none; cleared for all other countries, 55,000, against 30,000; receipts at all ports since last cable, 12,000, against 13,000; ditto since January 1, 409,000 bales, against 380,000 in 1887 and 505,000 in 1886. *Freight*, $6, against $5.50. *Exchange*, 6 months' sight, 3/5¼, against 3/8¾.—*Ker & Co., to Mr. Charles Nordhaus, 89 Water street, New York, per cable direct.*

JAPAN.

YOKOHAMA, August 15, 1888.—*Petroleum.*—The first cargo of Russian Refined Petroleum ever imported here direct from Batoum, per British steamer Monarch, consisted of 67,000 tins containing 536,000 gallons. It had been shipped on an order from Jardine, Matheson & Co., of China, by the Baku Commercial and Industrial Company. Upon arrival of this large supply in a lump American refined declined 5¢ ₱ tin. This shipment is to be followed by a larger one from the same source and parties, and the competition between the two sorts will thus be permanently established, much to the benefit of consumers.—*Japan Mail.*

SPAIN

BILBAO, September 22, 1888.—*Iron Ore.*—Our market has been active during the week at 7/6 @ 8/ Campanil, and 6/10 @ 7/3 Rubios, with several cargoes sold besides on private terms, total shipments for the week figuring up 80,000 tons, thus aggregating since January 1 2,717,879 tons, against 3,208,436 in 1887. *Pig Iron.*—Shipments amounted to 1000 tons abroad and 830 coastwise.—*Bilbao Maritimo y Comercial.*

SWEDEN.

STOCKHOLM, September 28, 1888.—*Iron Ore.*—The Lulea Ofoten Railroad Company, while still negotiating with the Government to get its Steel Rails admitted duty free, now also demands that the rolling stock it requires enjoy the same privilege. There have been landed at Lulea 89 cars from England on which the duty amounts to 31,000 crowns of 28¢ American, and as the company have refused to pay the duty on the same, they have been seized by the Customs' authorities; 150 cars additional have arrived since per steamer. The company employs at present 3000 workmen, 200 of them being miners in the Iron Ore mines. There are laid so far, starting from Lulea, 218 km. of railway, 13 of which above Gellivara. Exportation of Iron Ore to date amounts to 38,000 tons. The Provincial assembly at Noerbotten voted a subsidy of 100,000 crowns six years since, and this money is now to be paid the above railroad company.—*Dagbladet.*

ITALY.

MILAN, September 27, 1888.—*Iron.*—A new Iron works is to be founded in this city, with a share capital of 2,000,000 lire or francs, to be commenced with, but to be eventually increased. It is stated that a new process is to be introduced. The plant is to be large enough to be able to employ 500 operatives.—*La Patria.*

GERMANY.

HAMBURG, September 29, 1888.—*Iron.*—The demand for Pig Iron has been steady in Rhenish-Westphalia, but not active enough to prevent a gradual increase of stock. Larger orders for Spiegel have been received from the United States and elsewhere abroad, and there is an improved tendency therein in consequence. The quotation is 53 marks ₱ ton for 10 to 12 % Manganese. Forge Pig continues dragging at 46 @ 47 marks at Siegen; rolling mills only buy to cover current requirements. Bessemer is duller, Thomas as lively as ever. English Bessemer commands 45/6 @ 46/ on the West Coast. The local inquiry for Merchant remains satisfactory, but there is none for export. The same activity as heretofore is kept up in Boiler Sheets; Thin Sheets are slightly better at 149 at Siegen. The Wire branch is also slightly looking up. Foundries, machine shops and Car works are all doing well. The foreign Iron movement in Germany during the first seven months has been as follows:

	1888. Tons.	1887. Tons.
Export.		
Pig Iron, Scrap, Billets and Rails	101,940	199,902
Hardware, special Irons, Sleepers and Castings	482,277	541,489
Totals	584,217	741,391
Import.		
Pig Iron, Scrap, Billets and Rails	116,320	84,258
Hardware, special Irons, Sleepers and Castings	26,020	28,358
Totals	142,340	112,616

The import of Locomotives and Steam Engines increased from 18,199 tons to 23,266, and the export from 42,017 to 47,335. The export of Sewing Machines rose from 3827 tons to 4342. The import of Iron Ore increased from 604,548 tons in 1887 to 710,143 in 1888, and export from 992,109 to 1,257,065. *Metals.*—All metals have been steadily improving and remain firmly sustained.—*Borsenhalle.*

A New Swedish Rapid-Firing Gun.

At the Copenhagen Exhibition is shown the first specimen of a new Swedish rapid-firing gun, designed by Mr. Harald Thronsen and manufactured at the Finspong works, Sweden. This new gun is capable of firing 18 shots per minute with one man, while with two men it has a capacity of one shot every other second, or 30 shots per minute. The gun exhibited at Copenhagen has a cahber of 47 mm.; its entire length is about 52 calibers and the distance from the base of the projectile to the mouth of the barrel is 40 calibers. There are five different projectiles shown—viz., solid shot, steel shell, chilled point cast-iron shell, common shell and shrapnel, with 64 small projectiles; the weight is the same for them all—viz., about 3.3 pounds (or 1.5 kg.). The muzzle velocity is 2141 feet (657 m.) per second, with a charge of 750 grams of Swedish field-artillery powder; the maximum pressure in the barrel has been 2300 atmospheres. The mechanism is both simple and strong. The Finspong gun is mounted on a pivot carriage, so that it can be worked in all directions. It has a shoulder piece about the size of the butt end of an ordinary rifle, against which the man who works it places his right shoulder, and, with the right hand, he holds the trigger, or, if he works the gun by himself, works the lever that moves the eccentric, while the left hand rests on another lever, which, when pulled toward the man, acts as a brake and fixes the gun in any position and in all directions, so that several shots can be fired against a certain point, without it being necessary to repeat the aiming for each shot. The gun shown at Copenhagen has a screen of plate iron, but otherwise the gun is able to produce all-round fire. The material of the gun is wrought Martin steel.

The Largest Quick-Firing Gun in the World.—According to *Iron*, of London, extended trials are now being made by the naval gunnery experts of a new quick-firing gun which has a caliber of 6 inches, and is designed for projectiles weighing 100 pounds each. The gun is the invention of Sir W. G. Armstrong's firm at Elswick, and has already been exhaustively tested on their private range at Siloth. The specimen gun furnished for the naval trials has been mounted on board the Hector, an old armor-plated battleship, and some of the armor plates have been stripped off to enable a special port to be constructed which will admit of the special mounting of the gun being used to the best advantage, and will also provide security for the gunners against shell and machine gun fire from an enemy's ships. If the trials are successful, this powerful weapon will be used for the battery armament of the Nile and Trafalgar, and for the main deck batteries of the new fast cruisers, Blake and Blenheim.

Senator Wilson has been informed by Assistant-Secretary Maynard that the phraseology of Section 2510, R. S., providing for the importation in bond of "iron and steel rods, bars, spikes, nails and bolts, to be used in the construction and equipment of certain vessels," is not understood by the Treasury Department to include steel beams or what is called structural iron, but that under the regulations prescribed in pursuance of said law, steel and iron imported in shapes specified in the statute may be withdrawn for conversion into beams or other articles to be used in the construction, equipment or repair of such vessels, in which case the duties paid on the materials so withdrawn, manufactured and used are refunded in full.

Hardware.

The condition of business thus far in the present month is generally referred to as fairly satisfactory, there being a good though not exceptionally heavy trade in most lines. It is evident that the trade throughout the country are purchasing cautiously, not being disposed to exceed their near wants, and the stock of goods with both jobbers and retailers is regarded as generally light. Prices in most lines remain without change, being on nearly all staple goods the price of which is not artificially controlled, about as low as the profitable production of the goods will permit.

Barb Wire.

The New York market remains without change with a moderate business. Carload lots of Four-Point Galvanized are quoted at 3.6 cents, with about the usual advance for small lots.

The proposed organization of the Barb Wire manufacturers is understood to have been abandoned. This result was most unexpected to the gentlemen who met in Chicago on the 12th ult., by whom a plan of organization had been devised which met with the approval of every one present. All previous attempts to harmonize the trade had originated mainly with the small manufacturers, who could not secure the co-operation of the necessary number of the leading establishments, but this last effort sprung from some of the largest concerns, who were makers of the raw material as well as fencing. This fact gave the project an assurance of success, which appeared to warrant the sanguine expectations published at the time. The Barb Wire manufacturers generally were heartily disgusted at the profitless condition into which the trade had been plunged by excessive competition for business, without regard to the cost of production, and on all sides a feeling of satisfaction was expressed that a tangible method of relief had been devised. But when it was attempted to put the plan into effect an unaccountable indifference was manifested, even among those who were loudest in their expressions of approval, and the scheme was reluctantly given up. It is singular that the members of this important branch of industry are willing to allow it to continue still longer in its demoralized condition. Possibly each one feels himself able to stand the pressure until some of his competitors are obliged to drop out of the race, after which the business will right itself through the diminution of production and prices will advance to a profitable point. This seems to be the only explanation. At present the price of Plain Wire is advancing, but Barb Wire is kept down, some sellers offering the latter at a price below the cost of production by the best mills.

Wire Nails.

The existing arrangement between the leading manufacturers is reported to be working satisfactorily and prices are well maintained. The large quantity of Nails sold at the lower figures ruling previous to the recent advance enables buyers in some cases to purchase advantageously from second hands. Prices are $2.55 for carload lots, and $2.65 for small lots.

Cut Nails.

Although the volume of business is quite satisfactory and there are other encouraging features, the price of Cut Nails in the New York market remains still low, carload lots being available at $1.85 on dock for Iron Nails, while Steel Nails are stiffer. Two of the mills represented in this market have lately been buyers instead of being sellers, one of them on account of a strike. One Western mill which competed sharply, particularly at New England points, among them Springfield, Mass., has practically withdrawn, so that the number of cheap sellers has narrowed down to a few. Nails, especially in the East, have occupied an exceptional position for some time past. While other allied industries have had the benefit of a rise—Bars, Skelp and other classes of material are above the lowest point—Nails are stationary in spite of higher raw materials. Taking the price realized on an average specification, extras included, at $2 per keg at mill, and deducting the cost of keg, 12 cents, and cutting, 32 cents, the Iron fetches only 1.56 cents per pound. A comparison of this figure with the selling price of Bars, Skelp, &c., will show how exceptional is the position of Nails.

Miscellaneous Prices.

Last Thursday an advance was made in Shot, the present quotations being subject to a discount of 2 cents for cash in five days:

Drop Shot, per 25-pound bag	$1.50
Drop Shot, per 5-pound bag	.35
Buck and Chilled, per 25-pound bag	1.75
Buck and Chilled, per 5-pound bag	.40

The price of Lead Pipe and Sheet Lead has also been advanced ¼ cent per pound, present prices being Pipe, 7½ cents, and Sheet, 8¼ cents.

A meeting of the Carriage Trimmers' and Hardware Manufacturers' Association was held in the Hotel Anderson, at Pittsburgh, on Wednesday, the 3d inst. The condition of trade, which is reported to be only fair at present, was fully discussed, and the opinion prevailed that an improvement can confidently be expected at an early day. A new schedule of prices was submitted to the members, but not adopted. Some routine business was transacted, and the meeting adjourned to reconvene at the call of the secretary.

Stuart & McLean, Pittsburgh, Pa., are sending out to the Western and Southern trade circulars quoting prices on various lines of Hardware. They make a specialty of goods manufactured in and about Pittsburgh.

On the 3d inst. a meeting was held at the Grand Pacific Hotel, Chicago, of the executive and business committees of the Manufacturers' Association of Brass and Iron Steam, Gas and Water Fittings, to take action regarding a proposed increase of prices to meet the increased cost of copper. The association represents 85 per cent. of the total product annually marketed in the United States. A very thorough discussion took place in which all phases of the situation were carefully considered. It was found that some articles were being sold below the cost of production, while all others in which copper is used are marketed at a price affording but a bare margin of profit. It was determined, however, to maintain the present discount sheet until the annual meeting in New York, December 12, for the reason that the manufacturers outside the pool, representing about 15 per cent. of the product, are still keeping their goods at the present competitive rates, and the pool cannot afford to give them an advantage. Arrearages, rates and other questions were also considered, but no definite action was taken on them.

The general quotations for Wire remain without change, and there has been a withdrawal of some of the extreme prices which have recently been made by some of the manufacturers.

A disposition on the part of the manufacturers of heavy goods lying near the raw material to make slight advances is apparent, and in several lines some exceptionally low quotations have been withdrawn.

The price of the Arctic Ice Dogs, described on page 568, and manufactured by Geo. A. Waller, Seneca Falls, N. Y., is $6 per dozen pairs, subject to a discount of 33⅓ per cent.

Trade Topics.

From Fred P. Straub & Co., Evansville, Ind., we have received a carefully compiled and very interesting table relating to their purchases of goods during the 30 years in which they have been in business. From its bearing on the movement of trade and the relative positions occupied by manufacturers and jobbers in the distribution of Hardware to such representative houses, it will be of unusual interest and suggestiveness. The table, which is reproduced below, is, it will be observed, arranged so as to show the purchase of each year, and the percentage of goods purchased from manufacturers and jobbers, while at the same time it indicates the proportion purchased from Eastern and Western manufacturers and jobbers, respectively. The line of division between the East and the West passes through Buffalo and Pittsburgh, both of these markets being included in the West. In the column allowing purchases from Eastern jobbers purchases of imported Hardware are also included.

Percentage of bills purchased of—

Year.	Manufacturers.			Jobbers.		
	Eastern.	Western.	Total.	Eastern.	Western.	Total.
1858..	15	36	51	13	36	49
1859..	12	39	51	22	27	49
1860..	28	37	65	9	26	35
1861..	14	50	64	3	33	36
1862..	23	38	61	9	30	39
1863..	34	38	72	10	18	28
1864..	26	32	58	12	30	42
1865..	25	28	53	21	26	47
1866..	34	34	68	4	28	32
1867..	28	40	68	12	20	32
1868..	25	47	72	11	17	28
1869..	33	43	76	11	13	24
1870..	34	47	81	7	12	19
1871..	28	60	88	6	6	12
1872..	29	46	75	13	12	25
1873..	33	44	77	12	11	23
1874..	32	44	76	14	10	24
1875..	32	45	77	8	15	23
1876..	41	39	80	9	11	20
1877..	45	31	76	19	5	24
1878..	43	41	84	11	5	16
1879..	44	42	86	10	4	14
1880..	39	44	83	11	6	17
1881..	32	44	76	12	12	24
1882..	34	42	76	15	9	24
1883..	36	41	77	12	11	23
1884..	37	43	80	14	6	20
1885..	39	42	81	13	6	19
1886..	40	44	84	13	3	16
1887..	33	43	76	14	10	24
1888..	37	35	72	17	11	28

From this table it is evident at a glance that there has been a marked increase in the proportion of goods purchased direct from the manufacturers, with, of course, a corresponding decline in the amount of purchases from the jobbers, during the first ten years the average annual purchases from manufacturers amounting to 61 per cent., and during the last ten years to 79 per cent. It is, however, to be noticed as interesting and perhaps significant that during the present year up to date at which the table closes, September 28, the purchases from jobbers are represented by 28 per cent., the largest proportion in 20 years.

It is also interesting to notice the relation borne by manufacturers and jobbers in the East to their Western competitors, and it will be seen that the Eastern manu-

facturers have more than held their own, their average sales during the last ten years being 37 per cent., as against 24 per cent. the first ten years, a proportionate gain of more than 50 per cent, while during the last ten years the average sales by the Western manufacturers were 42 per cent., as against 37 per cent. in the first ten years, being a gain of less than 15 per cent. With reference to the purchases from the Eastern and Western jobbers, the result is, perhaps, still more surprising, there being a slight increase in the proportion of business done by those in the East, while there has been a marked decline in the proportion of purchases from their Western competitors, from whom the first ten years an average of 27 per cent. of goods was purchased, while the average has been only 8 per cent. in the last ten years.

It would obviously be unsafe to take the experience of any one house as indicating the general features of the trade, but in some points we doubt not that this table represents a quite general tendency in business, especially in regard to the increased disposition on the part of houses of like standing to purchase direct from manufacturers. With the rapid extension during recent years of manufacturing enterprises in the West, it would be surprising if, in the experience of many hardware houses, the Western manufacturers did not receive a larger proportion of business than in this instance appears to have been the case. But on this subject we shall be glad to hear from the trade, especially as relates to the tendency toward purchases from manufacturers, and whether the East is holding its former proportion of business. It is hardly to be supposed that many Hardware houses are as painstaking and systematic in analyzing and recording such matters as are the correspondents to whom we are indebted for this interesting contribution, but many of our readers who have observed the tendencies of trade are in a position to give facts and impressions which will be of general interest. The subject is a broad one, and has a practical bearing upon the business of the manufacturer, jobber and retailer.

Items.

The Iowa Farming Tool Company, Fort Madison, Iowa, have issued their illustrated catalogue, for the season 1888-1889, in the form of a beautiful light-printed pamphlet of very fine paper. Their extensive works are illustrated, their code given, and their regular line of Steel and Wood Goods, Wheelbarrows, Ox Yokes, &c., are represented. In the circular that accompanies the pamphlet they allude to the advantage of buying where a full line is made, where Snaths and Cradles and Steel Goods are all of one make and label.

The E. C. Meacham Arms Company, St. Louis, Mo., have issued, under date October 1, their catalogue No 383, in which a large line of Fire Arms and Ammunition is compactly represented. It is prefaced by a key to the quotations, which are given in characters, as usual with the company.

The Marlin Fire Arms Company, New Haven, Conn., in their 1888 catalogue call special attention to the Marlin Repeater, Model 1888, which has recently been put on the market, and also illustrates the Marlin Repeater, Model 1881, Ballard Rifles and Marlin Double-Action Revolver. Full information is given in regard to these different Arms and some related goods.

The Canton Saw Works, Canton, Ohio, in addition to their Sickle Edge Band Knives, Rolling Coulter, &c., have recently put on the market the Novel See-Saw and Merry-Go-Round, intended for nursery use. It is 6 feet long, supported on an iron standard, and has a seat adapted for children only. A larger size for the lawn and play room is 8 feet long and has seats for grown persons.

Tower & Lyon, 95 Chambers street, New York, have issued a catalogue devoted to Tower's Police Equipments, showing a line of Shields, Revolvers, Clubs and Belts, Adjustable Hand Cuffs, Leg Irons and Nippers, one of which, it will be observed, is described on page 74.

Pugsley & Chapman, 8 Liberty street, New York, issue a sheet showing the goods of their manufacture together with many others, including some well-known articles.

The Hart Hardware Company have recently begun business at Lincoln, Neb., as jobbers of Shelf and Heavy Hardware. L. C. Hart is president of the company from whom it receives its name; E. P. Berryman, vice-president; A. L. Havens, secretary; J. T. Clark, treasurer; William Patterson, manager. The authorized capital is $200,000, $100,000 being paid up. The company will occupy rooms in the H. T. Clark building on the corner of Eighth and P. They have four floors, each 50 x 100, and below this a basement 14 feet high and 50 x 125 in size. Just at the back door is the private track belonging to the building, and from this track large shutes lead directly into the basement for the unloading of all heavy goods. They will do an exclusively wholesale business, for which they will have the best facilities.

A new Hardware jobbing house is to be started at Omaha, Neb., on the 1st of January. It will be composed of a number of gentlemen connected with other Hardware establishments, who propose to engage in business on their own account. It is reported that it will have a capital of $300,000, of which $200,000 will be paid in. The name of the company has not been announced.

It is announced that George E. Bristow, of Providence, R. I., has been elected treasurer of the Nashua Lock Company, Nashua, N. H., in place of H. G. Bixby, resigned.

The Union Indurated Fibre Company, New York, issue monthly a sheet of new lines. September sheet offers Slop-Jar Mats, a line which will be readily recognized as serviceable and durable in this ware. Only one size, 21-inch, is ready. Store barrels and covers of this material are also offered in various sizes. One new size of Keelers is added, making a very complete assortment in this line, and Butter Tubs are also offered. One size only is ready, 25-pound Tub. These are described as far superior to and much cheaper than stoneware, wooden or other new Tubs, as light, easily kept sweet and clean, not easily broken, not affected by the brine and imparting no taste to the butter.

Oliver A. Smith, Clarkston, Mich., issues a circular relating to his Iron Land Roller and also to the Dakota Roller. The special features of these implements are explained.

C. F. Guyon & Co., 97 and 99 Reade street, New York, have been appointed agents for the Middle and Southern States for the Hot-Air Registers and Ventilators manufactured by the Chicago Sewing Machine Company. The manufacturers in a recent circular call attention to a few points in the construction of these goods, mentioning among others that their Registers are of the standard measurements, thus making them interchangeable with other goods; that the position and noiseless movement secured by their patent deserves particular attention, and that the permanent fastening is a very simple device, which can be attached at a small expense. The weight of the castings is also alluded to, as well as the fact that being made with four fans instead of three they are more easy of adjustment in dwellings.

The Twisted Wire Box Strap Company, corner Greenwich and Desbrosses streets, New York, issue a convenient pamphlet relating to their Twisted Wire Strap. A list is given of some of the principal firms using this Strap, with testimonials from a number of merchants and manufacturers, some of whom are well known to the Hardware trade.

Since their reorganization last May the Sterling Wrench Company, Sterling, Ohio, advise us that they have made improvements in the style and quality of their Wrenches, and allude to the success which they are now meeting. Their new Agricultural and Machinists' Wrench is described as having a handle like the Coes Wrench, and solid steel screw. It is intimated that still further improvements in this line are contemplated, and that a new special Wrench will soon be put on the market. Their circular mentions that, having made additions to their machinery, they now have a capacity of 50,000 per month.

By the announcement on page 56 it will be observed that the Le Page Company, Gloucester, Mass., for whom the Maltby-Henley Company, 20 Warren street, New York, are agents, are offering the Nameless Glue in trial-size packages, which are to retail at 5 cents per bottle.

Albert E. Currier, Chesterfield Factory, N. H., has issued a new illustrated catalogue and price list of his line of Auger Bits, Augers and Machine Bits. In his introductory circular he refers to the favor with which his goods have been received during the past 50 years, and alludes to their quality.

Whittier Elevator Company, 306 to 310 Eleventh avenue, New York, are putting on the market a line of Spring Mats made of wood and malleable iron, which are intended for doorways, cars, elevators, steamboats, &c. These Mats are described as made of tough elastic wooden slats molded into oval shape, forced into malleable iron cross bars, and finished in oil and coach varnish. The bars alone rest on the floor, allowing the slats to spring, and making the Mat elastic under foot.

The catalogue of the Keene Mfg. Company, Keene, N. H., illustrates their line of Long Reach Self-Adjusting Lever Club Skates. The different styles in which these goods are made are represented, and a Long Reach Lever Speed Skate is also shown. The simplicity and effectiveness of this self-fastening device are alluded to, and points are made in regard to the Skate that the grip on the sole or heel can be tightened or loosened without removing the Skate from the foot; there are no bolts, screws or other parts to lose or become loosened, and that no wrench or key is needed in adjusting the Skate.

W. J. Clark & Co., Salem, Ohio, have issued a pocket edition of their illustrated price list of Sheet Metal and Wood-working specialties. Their Elevator Buckets are prominently represented, the front cover containing an illustration of the old-style leather bucket. A variety of other goods is shown.

American Hardware in the Australasian Colonies.

A recent issue of the *Australasian Ironmonger* has a carefully prepared article on this subject, in which a general view is given of the position of American manufactures in the markets named. It deserves

careful attention from manufacturers, who will find in it suggestions and information which may be of assistance to them in their efforts to occupy or hold these fields. Omitting portions relating to machinery and other manufactures, we give the following extracts concerning Hardware and related lines:

NEW SOUTH WALES.

American Band Saws have long held a very high position here, and the Circular Saws and Vertical Saws from standard makers are making great headway.

Saw Benches, however, for ordinary lumber work, are all preferably of English make, no machine to compare with these being made in the States. The American Circular Breaking-Down Mill, with its traveling frame and adjustable head blocks for bringing up the log to the Saw, although possessing many good points for log work, is not received here with much favor, only a few comparatively being in use, and these, we understand, are principally of Canadian manufacture. The vertical breaking-down frames and also steel frames, with the exception of the few made in the colony, are all of English make, and it is unlikely America will compete in these machines, as in that country the Log Band-Saw Mill is rapidly being substituted for all other machines designed for this purpose. For circular and vertical Saws H. Disston & Sons are well known.

In Machinery for operating Tin Plates for preserved meat and fruit purposes, America, we should say, has the bulk of our trade. Doubtless this is due, as is the case of the wood-working machinery, to the extensive use made of the material in that country.

Weighbridges and Scales are largely imported from both countries, and although opinions seem pretty equally divided on the merits of the various machines, we think the English machines still command the readiest sale. A prejudice against the quantity of wood used in the construction of the American machine prevents its more general use, but with what show of reason we are not prepared to say.

Plated Ware.—Various consignments have been received here, but they do not meet with favor. They are too showy in style, not displaying that refined taste that the British manufactures show.

Locks, Keys and Latches of the Yale Company make have greatly come in demand of late years, all our public buildings being furnished with them. To note especially at the General Post Office the private letter boxes are all fitted with the Flat Nickel-Plated Key, which is much less cumbersome than our English-shaped Key.

Lawn Mowers of various makes are taking the place of English, being lighter, easier to handle and less costly.

In Cheese-Making Machines the English make are now nowhere. American are all the rage.

Axle Grease and Axle Oil is not being imported so much as formerly, that which is being made from our colonial shale being found equally as good and less costly, and is now largely used by the Public Works Department on our trams and railways.

American Hand Pumps are preferred, those of Douglas & Co.'s make having the largest sale. In Axes no question is raised as to their superiority over English make. Meat-Choppers, small Builders' Castings, Shelf Brackets, Pulleys, Sash Lifts, &c., are gradually gaining ground.

In Agricultural Machinery American manufactures need no comment. They are so well known and so largely advertised that we can say nothing further in their favor. The English of late have been taking a leaf out of their book, and combining lightness with strength.

NEW ZEALAND.

Next to Binders, the American implements which have had the largest sale in New Zealand are Corn Drills; of these the M'Sherry was the first introduced, and had the largest sale; next to these, and the one at present having the largest sale, is the Triumph, by Stoddart & Co. The disadvantages of the American Drill were its want of adaptability to the greater variety of grain sown in New Zealand: for instance, the Triumph is the only Drill that will satisfactorily drill peas. The American Drill also erred on the side of lightness, but being in use at a time of year when time was not so much an object, the question of durability is though more of by farmers, and the colonial-made machine has to a large extent taken the place of the American. A large number of Horse Hay Rakes are yearly sold. The very superior lightness and cheapness of the American nearly gives them the monopoly of this instrument. For the past three seasons a large number of Cleaning Machines, especially by Johnson & Field, have been on the market, and their low price makes them favored by farmers. They are being sold at less than half the price of the English machine. They are, however, not adapted for grass seed, which is a serious drawback to their use in many districts. In other other districts the large increase in weeds will lead to an extended sale. La Dow's Disk Harrows had a considerable sale eight years ago, as also had the Corbin, Higganum Mfg. Corporation, but for the last four years the colonial makers, owing to their improvements, especially in transport arrangements, have nearly stopped the sale of the American. The Faurt & Bradley Sulky and Gang Ploughs were introduced, and had a small sale some years ago, and the Deere, Deere Company, was also offered, but the colonially manufactured article is so eminently superior that the remedy of consignments could not have been encouraging. A considerable number, however, of the light, handy and cheap hill-side Ploughs are sold by Otago agents. These come from various makers in the States. In milling machinery American makers have done good business, especially Barnard & Lees. These have supplied warehouse and other-sized cleaners to many of the larger grain merchants and millers. A number of various makes in Smutters, Middlings, Separators, Scalpers and other machines for the economic treatment of flour are annually imported from America for new roller mills being started in various parts of New Zealand. The breaking-down rollers themselves are generally of English or Continental manufacture.

Carriages and Carriage Material.—The strength, variety, and beauty of American timber render it invaluable to the carriage builders in the colony, and they obtain nearly the whole of their woodwork, such as bent Felloes, Naves, Spokes, Rims, Shafts, body parts, and other bend timber, from the States. A few factories bend timber, but nearly the whole of this is of American growth. Common Nut Axles and half patent come from America; other patent varieties from England. Leather for trimming and hoods is also American; the greater part also of the malleable cast and drop forged iron fittings are from the same quarter. American Coach Bolts are generally used, but an increasing number of Nettlefold's Coach and Tire Bolts are finding their way into the hands of users. Nearly all of the light harness used is of American manufacture. Hill at one time sent a large quantity to this market, but of late years cheaper qualities have had the sales. A few years ago Hooker, New Haven, and Craft, New York, sent consignments of Buggies to this market, but the result was not such as to encourage a repetition. Abbott used to be in demand when a really first-class buggy was required; for some years, however, our leading colonial makers have been turning out work quite as good and 20 per cent. cheaper than Abbott Buggies can be landed. The Jackson Wagon Company also tried a consignment of their Farm Wagons here some years ago, but they did not take.

Arrangement of Stores.

The method of accommadating Wire Cloth which is illustrated in Figs 277 and 278 is thus described by the Griffith

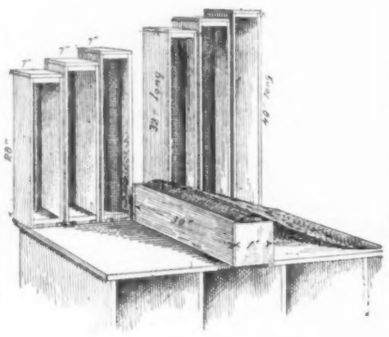


Fig. 277.—Wire-Cloth Rack.

Hardware Company, Rushville, Ill., to whom we are indebted for the matter relating to this unique and ingenious method, the convenience of which will be appreciated by the trade.

It consists of a row of boxes 6 inches square, made of ½-inch stuff, with double ends. The inside piece of each end is made of 1-inch stuff and the outside of ½-inch, each box being 4 inches longer than the width of the Wire Cloth. The top and bottom are left open. These boxes stand on end on the rear side of the Nail counter, and are hinged at the bottom so as to drop across the counter when in use, as shown in Fig. 277. A ⅝-inch rod

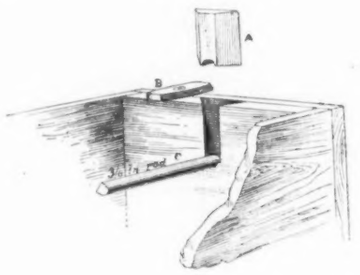


Fig. 278.—Detail of Box for Wire Cloth.

is put through the blocks usually found inside the roll, and each end rests in a slot cut in the inside piece of the end, 2 inches from the top edge when lying down on the counter, as shown in Fig. 278. The block sawed out is replaced in the slot and fastened with a turn button. To keep the block from slipping down on the roll when upright a 3-inch circular tin is nailed on the end of the block. A price card is kept on each box, giving cost and selling price per square and lineal f ot, so that no figuring is necessary. Besides the more obvious advantages possessed by this method, it is to be observed that a convenient straight edge to cut by is furnished by the edge of the box.

That a great deal of ingenuity and skill have been expended upon racks for Steel Goods has been made evident by the many of which we have given descriptions in

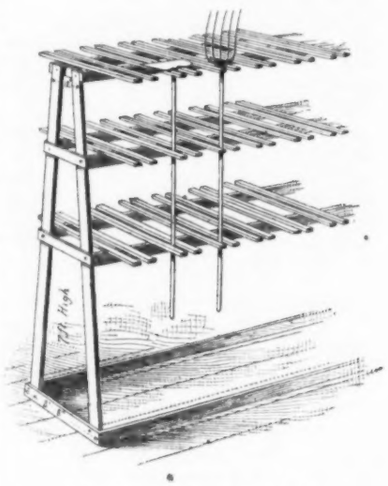


Fig. 279.—Steel Goods Rack.

this series of articles. From the variety thus presented it would seem that a Hardwareman ought to be able to find something which would answer his requirements. We have the pleasure, however, of adding to the assortment one which is in general design quite different from the prevailing type. It is illustrated in the accompanying cut, Fig. 279. We are indebted for information concerning it to Ford, Weakley & Johnston, Decatur, Ill., who describe it as follows:

The main frame is made of 1 x 4 inch lumber dressed on both sides. It is about 7 feet high, 1 foot wide at top and about 2 feet 8 inches wide at bottom. It can be made of any length desired. The cleats or cross pieces are 1½ x ⅞ inch, and extend over on either side of the rack about 7

inches. They are attached with screws and placed at least 1½ inches apart, so as to allow the Hoes to be put in or taken out easily. Each set or pair of cross pieces should be sufficiently wide apart to prevent the Hoes being tangled with others in adjoining spaces, and there should be at least three tiers of cross pieces, so as to keep the handles perfectly straight. The Hoes when placed on the rack rest each blade above the other and each space will hold at least half a dozen Shank Hoes, so that the rack will obviously accommodate a large number of Tools. The open spaces in the center afford an excellent place in which to store Hay Fork, Hoe and Shovel Handles. By driving stout Nails at the top of the rack a good place is provided for hanging Trace Chains. The rack can also be used for Garden Rakes and Long-Handled Shovels. By putting in extra cross pieces on the middle tier an excellent D-Handle Spade and Shovel rack is provided. There should be small hooks on each end of the cross pieces to prevent the handles from slipping off. One end of the frame should be fastened to a wall or column to make it steady. The rack we have is 10 feet long, and will hold no less than 15 dozen medium Hoes

Exports.

From recent manifests we make the following abstract showing the exports in Hardware and related lines, which will be interesting as indicating the lines that are going to the markets referred to:

PER SHIP PARAMITA, SEPTEMBER 21, 1888, FOR MELBOURNE, AUSTRALIA.

By R. W. Forbes & Co.—7 cases Sporting Goods, 45 dozen Axes, 9 packages Plated-Ware, 5½ dozen Wringers, 6 packages Choppers, 3300 Cartridges, 1 case Tricycles, 1 case Sporting Goods, 9 cases Hardware, 3 packages Hardware, 4 dozen Glue, 2 packages Hardware, 5 dozen Drills, 2 packages Hardware, 12 dozen Hammer Handles, 22 dozen Hatchets, 18 packages Hardware, 4 dozen Cow Bells, 35 dozen Axes, 90 dozen Shovels, 15,000 Cartridges, 19 packages Hardware, 100 dozen Axle Grease, 20 packages Hardware, 118 packages Carriage Woodwork.

By McLean Bros. & Rigg.—2 dozen Bush Hooks, 1 dozen Wringers, 5½ dozen Pistols and Cartridges, 36 dozen Tacks, 2 dozen Lamps, 12 dozen Fixtures, 6 dozen Fly Traps, 2 dozen Planes, 1 dozen Bench Screws, 12 dozen Axle Grease, 1 dozen Meat Choppers, 4 dozen Vises, 45 dozen Brooms, 17 dozen Saws, ¼ dozen Lawn Sprinklers, 20 kegs Nails, 1 case Butts, 19 dozen Granite-Ware, 3 Churns, 25 dozen Brackets, 28 dozen Braces, 29 dozen Vises, 30 dozen Brackets, 7½ dozen Pumps, 32 dozen Granite-Ware, 5 dozen Lamps, &c., 1 dozen Dies, 9½ dozen Planes, 16 dozen Gate Latches, ½ dozen Meat Cutters.

By A. Field & Co.—20,000 Tire Bolts, 12 sets Axes, 2 dozen Carriage Furnishings, 4 dozen Sockets, 3 gross Whip Lashes, 11 dozen Harness Tools, 20 dozen Harness Ware, 3 packages Harness Ware, 9 dozen Axle Grease, 1½ gross Harness Dressing, 9 dozen Axle Grease, 9 dozen Whips, 120 dozen Whip Handles, 5 gross Snaps, 1 case Hames, 1 box Hames, 18 Wringers, 35 dozen Harness Trimmings, 2 Creasing Machines, 1 case Harness Wheels, 3 dozen Curry Combs, 33 dozen Locks, 30 gross Pencils, 12 gross Wall Hooks, 5 dozen Hatchets, 5 dozen Spoke Shaves, 51 dozen Hooks, 1 dozen Wringers, 4 dozen Shovels, 2 dozen Locks, 10 dozen Saws.

By Tower Mfg. Company.—80 cases Slates, 5 cases Chalk, 2 cases Curry Combs, 1 case Brackets and Thermometers, 1 case Brackets, 1 case Side Brackets, 1 case Coat Racks, 2 cases Brackets, 1 case Toy Guns, 1 case Brackets.

By Mailler & Quereau.—167,000 Roofing Slates, 1750 pounds Handles, 810 pounds Handles, 40 pounds Axes, 15 cases Saws, 2 cases Vises.

By Morris, Strouse & Co.—4 gross Fly Traps, 2 dozen Money Drawers, 6 gross Fruit Jars, 6 gross Shade Rollers, 1½ dozen Clothes Wringers, 17 dozen Hatchets, 220 gross Safety Pins, 36 dozen Whip Stocks, 24 dozen Hatchets, 1½ dozen Clothes Wringers, 15 dozen Roller Skates, 3 gross Whisk Brooms, 132 pounds Washita Stone.

By Coombs, Crosby & Eddy.—8 dozen Hardware, 1 gross Shade Rollers, 7 dozen Shovels, 2240 pounds Bolts, 50 boxes Clothes Pins, 1 case Emery Cloth, 8 dozen Numbering Machines, 1272 pounds Nails, 24 dozen Traps, 12 dozen Wrenches.

By Arkell & Douglas.—150 dozen Brooms, 80 dozen Axles, 180 dozen Handles, 25 dozen Axes, 1-6 dozen Forges, 6 dozen Shovel Brackets, 9½ dozen Tools, 182 Glass Jars.

By H. W. Peabody & Co.—1 case Hardware.

By W. H. Crossman & Co.—3 dozen Tills, 3 cases Lamp Goods.

By Ilsley, Doubleday & Co.—3920 pounds Axle Grease, 672 pounds Axle Grease, 3 Gross Glue.

By Crane & McMahon.—30 cases Carriage-Ware, 24 bundles Carriage-Ware, 9 cases Spokes.

By Singer Mfg. Company.—609 cases Sewing Machines and Parts.

By Healy & Earl.—1 Horse-Power, 65 crates Stoves, 11 Reels, 2 boxes Bolt Cloth, 26 cases Woodworking Machinery.

By Ansonia Clock Company.—55 boxes Clocks.

By S. C. Levin & Co.—63,000 pieces Slates.

By McCoy & Sanders.—9 cases Hardware.

By Meriden Brittania Company.—4 boxes Plated-Ware.

By New Haven Clock Company.—1 case Clocks.

By White Sewing Machine Company.—28 cases Sewing Machines.

By H. P. Johnson.—2000 pounds Folding Chain.

PER BARK RUTH, SEPTEMBER 22, 1888, FOR PORT ELIZABETH, AUSTRALIA.

By New Home Sewing Machine Company.—38 crates Sewing Machines, 13 boxes Sewing Machines.

By Coombs, Crosby & Eddy.—1 dozen Irons, 32 dozen Handles, 15 dozen Axes, 30 dozen Brooms, 200 Plows, 35 dozen Tinware, 10,000 Nails, 184 Plows, 6100 pounds Nails, 4 dozen Plows. 10 cases Plow Parts, 3 Organs, 6 Washing Machines.

PER BARK JAMES G. BAIN, SEPTEMBER 24, 1888, FOR BRISBANE, AUSTRALIA.

By R. W. Cameron & Co.—11 packages Hardware, 20 Axes, 300 dozen Grease, 2 dozen Braces, 9 dozen Hardware, 2 dozen Wire Goods, 3 dozen Egg Beaters, 17 dozen Blocks, 12 dozen Hammers, 36 dozen Handles, 40 dozen Hoe Handles, 3 dozen Sad Irons, 4 gross Shade Rollers, 9 Scales, 12 Stoves, 6 dozen Saws, 1 dozen Plumbs, 30 dozen Shovels, 50 cases Clothes Pins, 3½ dozen Churns, 15 dozen Axes, 80 dozen Axes, 10 dozen Picks, 10 Stoves, 6 dozen Axes, 2 dozen Hatchets, 4 dozen Picks, 1 dozen Bush Hooks, 1 dozen Adzes, ½ dozen Mattocks, 20 dozen Shovels, 7 dozen Hammers, 84 dozen Chimneys, 1 box Tacks, 3 Guns, 6 Stoves, ½ dozen Barrows, 1 package Washboards, 500 Broom Handles, 1 dozen Saws, 68 dozen Handles, 11 dozen Pumps, 7 dozen Hoes, 2 dozen Corn Shellers, 1 dozen Sluice Forks, 1 dozen Hay Forks, 10 packages Hardware, 7 Scales, 1¾ dozen Scythes, 1 box Plated Ware, 1 dozen Braces, 12 Lamps, 1 dozen Blocks, 10 dozen Hoe Handles, 2206 pounds Barb Wire, 100 pounds Staples, 1 dozen Snaths, 12 dozen Axes, 10 dozen Picks, 30 dozen Shovels, 16 dozen Saws, 24 dozen Stoves, 12 dozen Lamps, 42 dozen Hoes, 6 Lawn Mowers, 8 Corn Shellers, 8 Wood Hoppers, 1½ dozen Grindstones, 42 sets Axles, 29 packages Carriage Material, 32 dozen Hatchets, 12 Hammers, 1 gross Shade Rollers, 15 dozen Tacks, 1 dozen Wheelbarrows, 6 dozen Washboards, 50 gross Clothes Pins, 3 Guns, 82 dozen Handles.

By Healy & Earl.—3 boxes Emery Wheels, 3 boxes Emery Machinery.

By F. B. Wheeler & Co.—16 dozen Brushes, 1 case Carts, 2 cases Clocks, 12 cases Hardware, 2 cases Forges.

By Strong & Troubridge.—1 case Hardware, 1 case Chisels, 1 case Hammers, 3 cases Saws.

By Winchester Repeating Arms Company.—10 cases Cartridges.

By Coombs, Crosby & Eddy.—84 gross Hardware, 33 gross Axle Clips, 10 dozen Stove Parts.

By V. Basanta.—40 dozen Axes, 46 dozen Lamp Goods, 54 dozen Handles, 80 dozen Hatchets, 100 dozen Axes, 18 dozen Hoes, 19 dozen Files and Saws, 1½ dozen Velocipedes, 200 dozen Slates, 6 dozen Hammers, 12 dozen Razor Strops, 20 Shovels, 15 dozen Wrenches, 30 dozen Hammers, 6 dozen Snaths, 1000 Broom Handles, 12 gross Clothes-Pins, 5 dozen Rolling Pins, 25 dozen Chain Seats, 24 Stoves, 3 gross Axle Grease, 2 gross Hide Whips, 1 dozen Perambulators, 21 dozen Traps, ½ dozen Scales, 7 dozen Lamp Goods, 75 dozen Lamp Chimneys, 50 Washboards, 1 dozen sets Sad Irons, 35 dozen Electro-Plated Ware, 3 dozen Electro-Plated Ware, 26 dozen Lampware, 20 dozen Lamp Goods.

By Collins Company.—200 dozen Edge Tools, 198 dozen Edge Tools.

By New Haven Clock Company.—2 cases Clocks.

By Ansonia Clock Company.—21 cases Clocks, 12 boxes Clocks.

By E. T. Hopkins.—17 cases Lawn Mowers.

By W. H. Crossman & Bro.—15 packages Carriage-Ware, 12 packages Carriage-Ware, 42 Stoves.

By H. W. Peabody & Co.—35 packages Hardware, 1 case Lampware, 3 packages Lampware, 10 packages Pumps, 5 cases Hardware, 1 case Fire Arms, 8 cases Hardware.

By R. W. Forbes & Son.—1 box Plated Ware, 1329 pounds Carriage Bolts, 24 sets Wheels, 2 cases Carriage Hardware, 4 packages Carriage Hardware, 16 packages Agricultural Implements.

PER BARK HERBERT BLACK, SEPTEMBER 25, 1888, FOR BRISBANE, AUSTRALIA.

By C. S. Lascelles & Co.—165 packages Washboards, 200 boxes Clothes Pins, 6 crates Stoves.

By Welsh & Lea.—5 cases Iron Bolts.

By Millers Falls Company.—12 boxes Boring Machines, 7 boxes Scroll Saws, 1 box Vises, 14 Breast Drills, 23 dozen Hack Saws, 22 boxes Hardware.

By Arkell & Douglas.—44,800 pounds Wire, 20 dozen Shovels, 50 dozen Handles, 40 dozen Washboards, 2½ gross Axle Grease, 25 dozen Axes, 200 dozen Handles, 40 dozen Hatchets, 100 dozen Shovels, 20 gross Blacking, 15 dozen Axes, 30 dozen Axes, 25 dozen Axes, 12 dozen Blocks, 40 dozen Hatchets, 75 dozen Axes, 12 dozen Axes, 10 cases Slates, 2 1-6 dozen Pumps, 245 pounds Hardware, 4 dozen Picks, 8 dozen Hatchets, 25 dozen Axes, 24 dozen Lampware, 1½ gross Axle Grease, 6 dozen Whips, ⅛ dozen Boring Machines, 700 boxes Clothes Pins, 128 dozen Handles, 1 case Wicks, 12 dozen Forks, 6 dozen Braces, 48 dozen Clips, 12 dozen Washboards, 96 dozen Handles, ½ dozen Lawn Mowers, 12 dozen Hammers, 24 dozen Rakes, 1 dozen Churns, 360 pounds Oil Stoves, 24 dozen Hose, 24½ dozen Chimneys, 8 Guns, 10 dozen Plated-ware, 20 dozen Hatchets, 16 dozen Picks, 5 dozen Axes, 1 case Adzes, 60 dozen Axes, 10 dozen Spades, 130 dozen Shovels, 1 dozen Hay Knives, 33 packages Axle Grease, 500 Cartridges, 24 dozen Saws, 50 dozen Axes, 51 dozen Hatchets, 18 dozen Picks, 3 dozen Pails, 1 dozen Shellers, 6 dozen Axes, 212 dozen Lamp Goods, 10 dozen Snaths, 800 pounds Castings, 1199 pounds Nails, 3 dozen Wrenches.

The Art of Buying Goods.

BY KNARF.

There are so many things contingent upon buying goods for profit that it is hard to know which to give the most prominence to—in fact, no one thing can stand out pre-eminent, as a combination of characteristics are necessary to success in this branch of business. It has been said of the fine arts, of painting, of sculpture, of music, and may be said of any vocation or business, it money-getting is the only, or prominent, object in view, the result will be failure. The love of the occupation will generally carry success with it, as the work will usually be thoroughly done, faithfully done, and done as well as the person knows how, which continued practice will lead to perfection. A man with a thorough education has, already, the advantage of an illiterate competitor, as knowledge is power; and an education, especially if coupled with observation, gives that fund of general knowledge which is indispensible in business life.

We will confine ourselves to retail buying in the Hardware, Iron and Stove trade. The taste and judgment exercised in quality and price needful in the dry goods buyer does not enter largely into our needs. The horror expressed by persons in other lines of business at our "discounts" is amusing, as they have a dread of much figuring. This same mental exertion gives us men of minds, minds as thoroughly disciplined as that of a college graduate, if our buyer is conversant with Hardware business in its various departments.

The ease with which buying is done at the present time contrasts forcibly with the time and labor necessary to buy a six months' supply of goods of 40 years ago. The merchant found his way to Chicago then as best he could from his home. From there by lake, canal and stage to Albany and by the river from there to New York. Now the retailer has quite an extensive library of large, handsomely bound catalogues from the manufacturers and jobbers, with almost every article illustrated,

and, in most cases, a universal price list on each class of goods of corresponding grade and class. Comparative lists of Locks aid in selecting the same style of some other make, and telegraph cipher condenses a large order into the ten-word limit. The facilities for buying goods have kept pace with the numerous other improvements in doing business.

The old adage that "Goods well bought were half sold" still holds good, not only in price, but also in quality, quantity and desirability for your local trade. The drummer may be looked upon as a necessary evil, or a blessing, according to the man; but the merchant and the drummer are of mutual benefit to each other, and every traveling man should be entitled to a courteous reception and subsequent considerate treatment, until he makes himself so obnoxious you can't stand it any longer, then fire him. For change in prices, new goods and a hundred and one other points of information, we are dependent upon him. So treat him nicely. A thorough perusal of all price currents, advertising leaflets, and such matter as may come through the mail to you, is well worth the time spent. If nothing shows itself of immediate advantage to you, there are points to make memorandum of, and cuts you will need some time, that should be transferred to an indexed scrap-book. The next man who comes in may want just what you saw on a circular, and now the boy is using that circular to clean a lamp chimney with. A short time spent in conversation with each salesman will generally give you enough new information regarding his line of goods to pay for the time spent. Let it be understood, when you say you do not want any goods this trip, you mean it. This knowing your wants will save you much annoyance by men hanging around the store, expecting to urge or worry you into buying a bill. It always reminds me of caged lions to see a drummer follow the merchant back and forth, up and down the store, one on either side the counter, trying to sell him goods, which the undecided answer of the merchant gives him hopes of doing. Always have a "want book," and when out of anything or nearly out, see it gets set down as a memorandum to buy by. Toiling through a 1000 or 1200 page catalogue with each traveler, and being asked at each page, "Do you want this?" is not what it is cracked up to be; it is time wasting and temper trying. After a want book, the next most important thing is some convenient and accurate plan of keeping prices. There are more than enough things to remember, without burdening your mind with things that can be committed to paper. Discounts on Bolts, Screws, &c.; staple goods can be remembered, as you are buying frequently, but the great mass of prices, many of them net, is too much rubbish to burden the mind with; and in most cases you are not sure enough of their being correct to say you are right, and be wrong in the price. Some houses instruct their traveling men to make low prices on Staples, and to more than make up the loss of profits on Shelf Goods or Fancy Hardware. You want to be posted for these fellows. A copy of the order should always be retained. Some people have a way of "stuffing" orders, or the house may consider prices on some articles too low, billing those goods higher than the agreed price. A salesman's name attached to an order is the surest way of getting the required rebate. Goods may arrive before the invoice does, and may be checked off from the copy of order, saving time, getting the goods out of the way of light fingered people, or enabling the price to be set on some article a customer wants at once. Always be in a position to know the correct buying and selling price of each article.

It is safe to presume that the quantity of any class of goods may be increased a little over the previous year's purchase, to accommodate an increasing trade in season goods. There may be failure in crops, financial disturbance at large, or some unlooked-for reason why trade in general is not good; in such a case misery has company in your competitors. A good assortment of any line is better than all of a kind. The ready excuse of those purchasers who give their own town the go-by and buy goods in some larger town or city is, "We had a better assortment to choose from." When you get an assortment that satisfies your trade, keep it up; don't run out of goods. The article that you are tired of seeing on your shelf, and that you have been trying to get rid of for six months or a year, is no sooner sold and you congratulate yourself that it is gone, than the next customer wants the same thing. If you are carrying any particular line of goods and people know that you make a specialty of them, keep it well up, even if you make a special order for it.

When ordering one article for a customer it is often well to order an extra one for stock; some retailers make it a rule to always do this, and generally to their profit. While a new thing brings a good price while new, it is well to be conservative in the practice of being the first to introduce new goods; it is safer to wait until a demand has been created for them. Adjustable Pot Covers, for instance, probably had the largest sale of any article recently put on the market, because buyers thought them saleable and that there would be a demand for them; I know of nothing that you will find on hand so near the original amount purchased as these same Adjustable Pot Covers.

Your store could soon be filled up with goods having no better selling qualities because they don't take. Wait for the demand. When a house retails from $15,000 to $20,000 worth of goods a year there comes the feeling that goods must be bought from manufacturers instead of jobbers. The manufacturer gladly quotes prices, but to secure 5 per cent. to 10 per cent advantage in cost a certain quantity must be taken, which is much in excess of your former purchases in any one line. You overload yourself, while your competitor with less means buys less and has his nimble sixpence ready to invest again, while your capital is locked up in goods you are carrying over. A large number of the yearly failures may be traced to buying in too large quantities. With the facilities for getting goods in a short time little excuse exists for imposing on yourself. Under these existing circumstances it is injudicious to buy for future delivery to satisfy the traveling man, "so the house may know he has called on you," unless it is season goods that are ordered. When season goods are presented by the salesman, even though it be six months ahead, then is the time to talk about them. He has prices, styles and information at his tongue's end then. If not bought then you may not think of them again until the time for showing them arrives, and traveling men, supposing you have bought, will not think of offering them later. By this time stocks in jobbers' hands will be broken, and some early bird can't wait until you order for him, and there you are.

The class of goods bought, the quality, depends upon your trade. The style will depend upon your location in the country. A Michigan pattern Axe would be dead stock in Missouri, and the same style in handle and blade of a Pocket-Knife would not suit a Northern and Southern man. In buying a line of goods it is usually safe to buy one article that is high priced. You can probably get cost for it; it makes a show and makes talk, which is good advertising, besides giving a good assortment. With some customers nothing on earth is too good for them, until they hear the price, when you can make a sale of one of the cheaper ones. Some are always crying low prices, and, as contradictory as the statement may seem, low prices are not desirable. More money is made when goods are high than when they are low. If certain per cents are added to goods that you sell $20,000 of during one year, and the cost of the same class and quantity of goods is less the succeeding year, the net profits will be less, if figured at the same per cents to arrive at the selling price. A larger quantity of goods will also have to be sold to make the sales reach $20,000. So a low price on goods is not desirable. Sometimes goods may be presented in such a way that you will find it desirable to purchase after you have positively declined doing so. If it will be to your advantage do not be too proud to change your mind. Even if you are full of a line of goods, inquire the price, as there may be an advance you want to take advantage of in selling, or there may be a decline in price you will want to meet, and not have your stock left on your shelves by your competitors selling them lower. You may think at the time he is a fool and is losing on this line when he is in reality making a good profit at the decline in cost.

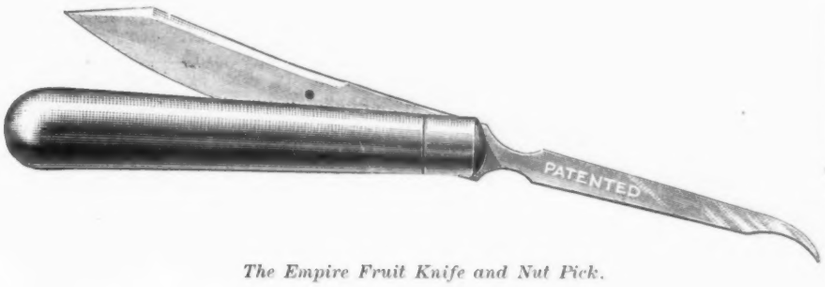
The Union Indurated Fibre Company, of New York, have recently shipped some 50,000 feet of their pipe to the Bell Telephone Company, of Philadelphia, This is now being laid in Market street, and so much to the satisfaction of the telephone company that we understood that they were ready to place an order for some 200,000 feet more which the fibre company were obliged to decline on account of their inability to deliver rapidly enough. The pipe is pressed out from wood fiber, and treated so as to render it impervious. Its advantages for underground work are obvious. The company have recently received a letter from General Greely of the Signal Service, relative to the merits of fiberite battery jars furnished the department. These jars are reported upon by Lieut. Frank Greene, of the Signal Corps, in charge of the telegraph division. Lieutenant Greene considers that these fiberite battery jars will make an excellent substitute for the glass ones which have been in use, as they will always retain their shape, are much easier to keep clean and renew, and are not liable to breakage from freezing or violence in transit.

According to the Roanoke, Va., *Evening Telegram*, the pay-roll for the month of August at the Roanoke Machine Works amounted to over $50,000. The roll shows that 1120 men were employed at the time, and the force is constantly being increased. The immense extent and capacity of these works can be judged from these figures. Less than six years ago Roanoke itself had barely 400 inhabitants.

The Chicago Forge and Bolt Company, Chicago, are making a new car of iron and steel for brickmakers' use, which possesses features of value. The journals consist of friction rollers, enabling a very heavy load of bricks to be pushed with ease by hand. The body of the car is made of a channel bar bent to form a square frame, to which the wheel seats are bolted. The car is loaded with green brick and pushed into the kiln, remaining without injury until its load is sufficiently burned, thus economizing labor in handling the brick. The rollers on which the car axles revolve were the chief difficulty in constructing these cars, and exhaustive experiments were made in perfecting them, to secure a pattern which would work satisfactorily after exposure to the intense heat of a kiln.

The Empire Fruit Knife and Nut Pick.

The Empire Knife Company, West Winsted, Conn., are putting on the market the novelty named above and represented in the illustration herewith given, which, however, fails to represent the attractiveness of the handle, which in the sample we have seen is a floral design in oxidized and bright plate. The illustration represents the article full size. The

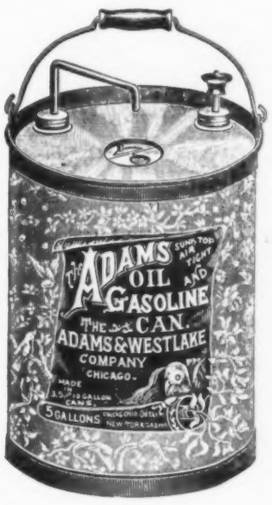


The Empire Fruit Knife and Nut Pick.

fruit blade and the nut pick are of one piece, the one shutting into the handle while the other is in service and *vice versa*, thus making a most convenient and dainty knife and pick. The advantage of having the fruit knife and nut pick together and not in separate pieces is alluded to by the manufacturers, as well as its convenience for home use for the parlor and for daily service. It is guaranteed 12-ounce silver plated. Each knife and pick is put up in a plush case, which is inclosed in a card box.

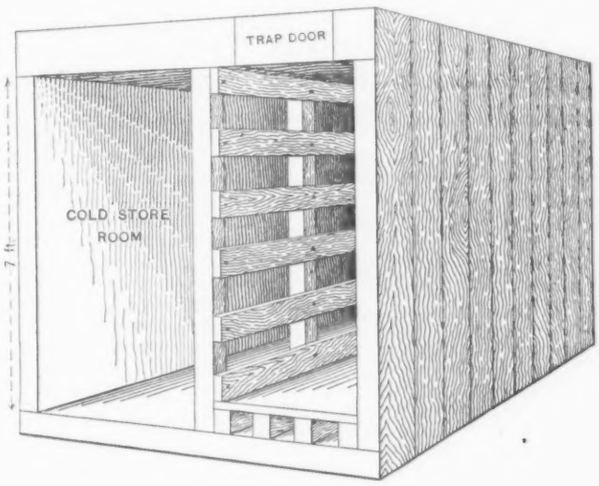
The Adams Oil Can.

The Adams & Westlake Company, of Chicago, are putting on the market a new can for holding oil and gasoline which they have named the Adams. The accompanying cut is an excellent representation of it. It is made of IXX steel plate. It has a wooden bottom and a retinned wrought-iron spout, and is not easily bruised or dented. It is fitted with a pump for the easy extraction of the contents, and the top of the can is sunk to catch a possible overflow. The spout adjusts itself to the hight of a lamp or other receptacle placed under it to be filled. The slot for filling is air-tight, so that no loss by evaporation will occur. The can is ornamented by the company's oxidizing process and is furnished in assorted colors, forming a pleasing contrast with the silver finish of the tin plate. Two sizes are made, one holding 3 gallons and one 5 gallons. They are packed for shipping in racks of a half dozen.



A Basement Refrigerator.

A correspondent in Boston writes to us as follows: "Some years ago the writer was asked for a plan of a cooling room to be made in the basement or cellar, under a grocery store. The proprietor of the store was a large buyer of butter and other products from the farmers, and the ordinary ice box in the store was found to be too small, and there was no room for a larger one, so it was resolved to build a refrigerator in the basement. The inclosed drawing is intended to explain the general features of construction, and while there may be nothing novel or original about the affair, it may offer some useful hints to some of the readers of *The Iron Age*. The matter of size and material would depend upon circumstances; for example, where sawdust is plenty that material could be used to fill the exterior double walls. If this material is not at hand, a liberal use of building paper or asbestos sheathing would secure the desired result of making the walls as near non-conductors of heat as possible. The door to the cold storeroom and to the ice-room can be placed where most convenient, and should be made double, like the walls. It might be a good plan to have a trap door in the floor above, then the cakes of ice could be lowered by means of a rope. If the inner walls of the cold room are covered with zinc or galvanized iron, and a ventilating pipe is put in at the bottom, butter and such articles could be kept very nicely. Since butter absorbs odors very rapidly, great care has to be taken in the manufacture and use of refrigerators on this account. It is not pleasant to have butter taste like a pine board, as it might if kept in a box lined with pine. The metal partition between the ice and storeroom might be provided with sliding doors at top and bottom so a current of cold air could be produced from the ice. When ice is kept on top of the storeroom, it is difficult to prevent the condensed moisture from dripping into the articles below, without interfering with some of the numerous patents now in force, as the writer knows from experience. The bottom and sides of ice-room should be covered with metal so as to catch the water, a pipe with trap being provided to take it away. Any suitable grating can be made to prevent the ice from injuring the metal bottom."



A Basement Refrigerator.

The Supply of Natural Gas.—There is no failure in the supply of natural gas. This is the point made by the Pittsburgh *Times*, by whom many facts are cited in support of the position. The editor concedes that great gushers are diminishing in districts where additional wells are drilled, but new developments more than offset the loss in these special instances. Natural gas operators, we are told, all admit that the gas is failing in some fields in the sense that the first wells in a territory had a greater pressure when struck than they have now. A number admit that the great volume of gas taken from such fields as Murraysville has lessened the flow, and are not surprised. But they hold that the new territory being developed will produce more than the equivalent of the failure in the first fields. Numbers of great gushers, such as those at Bellevernon, have not yet been brought into use. Natural gas experts agree that the present generation need not worry over the fuel supply, as none will live to see the natural gas supply give out. But, they argue, if it should fail, fuel gas can be furnished under patents of Pittsburghers at a mere trifle more than the cost of natural gas. This being the case, and Pittsburgh's fuel gas system is a tried certainty, the bugaboo of fuel failure in Gasdom held up by envious Eastern cities, is of no consequence.

The Corinth Canal.—One of the oldest engineering projects in the world is now gradually approaching completion, and the work will probably be finished during the coming year. This is the canal through the Isthmus of Corinth, in Greece, which was first planned some 25 centuries ago, and on which work was actually begun under the Emperor Nero, so that over 1700 years will have passed between its beginning and its final completion. As finally excavated the canal will be 4 miles long, with a depth of 8 m., or sufficient for the largest vessels which usually navigate the adjacent seas. The total cost

of the canal will be about $9,000,000, or $4,000,000 more than the original estimate.

Star Steel Fence Posts.

Oliver Bros. & Phillips, Pittsburgh, Pa., are manufacturing a line of steel fence posts, which they designate as the Star. They are illustrated in the accompanying

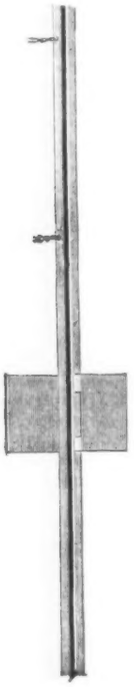


Fig. 1.—Star Steel Fence Post.

cuts, Fig. 1 showing a portion of a post, indicating the manner of its construction and the way in which the wire is attached, while Fig. 2 gives a sectional view, full size. The low price at which these goods are furnished, the fact that no staples are

Fig. 2.—Sectional View of Fence Post.

required, and the ease with which the fence is constructed, are points made in their favor. It is suggested by the manufacturers that wooden posts be used every 100 feet, steel posts in between, making a

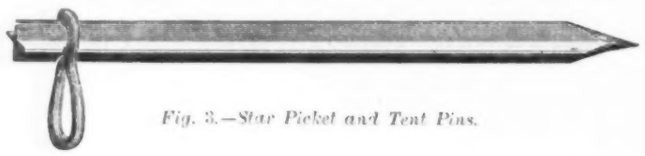


Fig. 3.—Star Picket and Tent Pins.

light, handsome fence. Fig. 3 shows the Star picket and tent pins, which are formed, it will be observed, on the same principle.

In all the prairie regions where timber is scarce, there is always trouble keeping in a supply of fire-wood for starting the fires of locomotives. They manage that business at the Wabash Western shops, at Moberly, Mo., in a way that is worthy of imitation by other roads. All the worn out ties along the line of the road are brought here, cut up by contract for 50 cents a cord, and the wood is said to be as good for firing up as ordinary fire-wood that costs $3 or $4 a cord.

Thomas' Automatic Police Nippers.

This article, which is put on the market by Tower & Lyon, 95 Chambers street, New York, is represented in the illustration, which in a general way indicates its special features. When the nippers are closed a slight pressure on the projecting button, seen under the handle, opens the nippers, at the same time forcing the projecting piece outward, as shown in the cut, which represents the implement partially open. In putting the nippers on the wrist the projecting piece comes in contact with the wrist, thereby automatically closing it, and at the same time locking it, it being only released by pressing on the button as above. It is thus referred to as automatic, self-closing and self-locking. It is well-made and finished in nickel plate.

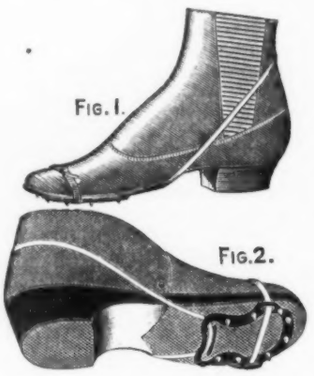
Thomas' Automatic Police Nippers.

Senator Sherman on Commercial Union.

Senator Sherman gives free expression to his views in favor of commercial and political union with Canada. "It is true," he says, "that commercial union tends to increase trade, and yet political union is the only thing that can bring about absolute reciprocity of trade and communion of interests." Again, "If you have exactly the same duty the prices would be just the same, and nothing would be gained by smuggling. There are more than 1,000,000 native Canadians living in the United States, and citizens of the United States have more than $100,000,000 of capital invested in Canada. The similarity of the people in language, descent, habits and institutions makes union easy and natural. The lines of commerce from Canada to this country are lines of longitude and not of latitude. The coal of Nova Scotia is shipped to New England and the anthracite of British Columbia is needed in California. Ohio sends her coal to Ontario cheaper than Nova Scotia or British Columbia can. The iron, copper, nickel, silver and lumber of Canada north of the lakes are more easily transported to populous regions like Chicago and Buffalo than in any other direction. They will not bear transportation to England, as the cost is too great. Canada wants our markets and the United States wants her natural resources. All the products of Manitoba and the Northwestern Territory naturally follow the valley into Minnesota and Dakota. It is a fight with nature to carry those products east or west over the mountains. The maritime provinces of Canada have their natural outlet and market in New England, which can furnish them capital and enterprise. The United States will find in these provinces what the United States needs, a real nursery for seamen. The provinces will fall heir to all the fisheries of New England without dispute or contention. I know of no province or section but would gain largely by union without losing any local advantage it now possesses."

Arctic Ice Dogs.

The accompanying illustrations represent the special features of the line of ice dogs or creepers which are patented and put on the market by George A. Waller, Seneca Falls, N. Y. It will be seen that they consist of a light malleable casting which fits to the sole of the shoe and is fastened to the foot by means of a toe strap and an endless elastic band drawn high over the heel, thus holding the dog to its



Arctic Ice Dogs.

place. It is obvious that thus attached they are easy of adjustment and quickly put on or taken off. Their simplicity and security are alluded to by the manufacturer. They are made in two sizes, for ladies and gentlemen, respectively, and the point is emphasized that the manner in which they are fastened to the foot adapts them equally well for use with boots, shoes or rubbers. They are intended to retail for 50 cents per pair.

It may not be without interest to our readers to know that arrangements are at present being made for the introduction in the United States of the Serpollet capillary steam boiler, briefly described in *The Iron Age* a few weeks ago. One of the boilers is now on exhibition in New York at the establishment of the American Gas Saving Company, 733 Broadway.

There are 21 cotton mills in Japan, the number having more than doubled during the past two years.

CURRENT HARDWARE PRICES.

OCTOBER 10, 1888.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.

Caps, Percussion, ₩ 1000—
Hicks & Goldmark's
F. L. Waterproof, 1-10's ....50¢
E. B. Trimmed Edge, 1-10's ....65¢
E. B. Ground Edge, Central Fire, 1-10's, 70¢
Double Waterproof, 1-10's $1.40
Musket Waterproof, 1-10's ....50¢
G. D. ....28¢
S. B. ....30¢
} dis 25@ 25& 7½ %

Union Metallic Cartridge Co.
F. C. Trimmed ....50¢
F. L. Ground ....65¢
Cen. Fire Ground ....70¢
Double Waterproof $1.40
Double Waterproof, in 1-10's $1.40
} dis 25@ 25& 7½ %

S. B. Genuine Imported ....45¢
Eley's E. B. ....54¢ @ 55¢
Eley's D Waterproof, Central Fire $1.60

Cartridges—
Rim Fire Cartridges ....dis 50&5&2 %
Rim Fire Military ....dis 15&2 %
Central Fire, Pistol and Rifle ....dis 25&5&2 %
Central Fire, Military & Sporting ....dis 15&5&2 %
Blank Cartridges, except 22 and 32 cal., an additional 10 % over above discounts.
Blank Cartridges .22 cal ....$1.75, dis 2 %
Blank Cartridges, 32 cal. ....$3.50, dis 2 %
Primed Shells and Bullets ....dis 15&5&2 %
B. B. Caps, Round Ball ....$1.75, dis 2 %
B. B. Caps, Conical Ball, Swaged ....$2.00, dis 2 %

Primers—
Berdan Primers all sizes, and B. L. Caps (for Sturtevant Shells) ....$1.00, dis 2 %
All other Primers, all sizes ....$1.20 dis 2 %

Shells—
First quality, 4, 8, 10 and 12 gauge ....dis 25&10&2 %
First quality, 14, 16 and 20 gauge ($10 list) ....dis 20&10&2 %
Star, Club, Rival and Climax Brands, { 10 gauge, $9 list / 12 gauge, $8 list } ....dis 33⅓ &10 2 %
Club, Rival and Climax Brands, 14, 16 and 20 gauge ....dis 30&10&2 %
Selbold's Combination Shot Shells ....dis 15&2 %
Brass Shot Shells, 1st quality ....dis 60&2 %
Brass Shot Shells, Club, Rival, Climax ....dis 65&2 %
A. B. & C Co., I. X. L., 10 & 12 gauge ....dis 40&5&2 %
A. B & C Co., "Special," 14 gauge ....dis 30&10 &5&2 %
A. B. & C. Co., "Special," 10 & 12 gauge ....40&10&2 %
Fowler's Patent, 10 & 12 gauge, ₩ 100 ....$3.95
Small extras given by some dealers.

Shells Loaded—
List No. 19, 1887 ....dis 20 & 10 %

Wads—
U. M. C. & W. R. A.—B. E., 11 up $2.00
U. M. C. & W. R. A.—B. E., 9&10 ....2.30
U. M. C. & W. R. A.—B. E., 7&8 ....2.60
U. M. C. & W. R. A.—P. E., 11 up. 3.10
U. M. C. & W. R. A—P. E., 9&10 ....4.00
U. M. C. & W. R. A.—P. E., 7&8 ....4.90
} Dis 20&2 % With small extras.

Eley's B. E., 11 up $1.75
Eley's P. E. 11 @ 20 ....$2.80

Anvils.—Eagle Anvils ....₩ ℔ 10¢, dis 20 @ 20&5 %
Peter Wright's ....9½¢
Armitage's Mouse Hole ....8¾¢
Armitage Mouse Hole, Extra ....11½@11¾¢
Trenton ....9½¢@9¾¢
Wilkinson's ....9¼¢@10¢
J. & Riley Carr, Patent Solid ....11@11½¢

Anvil Vise and Drill—
Millers Falls Co. ....$18.00, dis 20 %
Chenev Anvil and Vise ....dis 25 %
Allen Combined Anvil and Vise ....$5, dis 40&10 %
Moore & Barnes Mfg. Co. ....dis 33⅓ %

Augers and Bits.

Douglass Mfg. Co.
New Haven Copper Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher)
Cook's, Douglass Mfg. Co. ....dis 70 %

Cook's, Douglass Mfg. Co. ....dis 55 %
Cook's, New Haven Copper Co. ....dis 50&10@50&10&5 %
Ives' Circular Lip ....dis 60 %
Patent Solid Head ....dis 30 %
C. E. Jennings & Co., No. 10, extension l'p ....dis 40 %
C. E. Jennings & Co., No. 30 ....dis 60 %
C. E. Jennings & Co., Auger Bits, in fancy boxes, ₩ set, 32¼ quarters, No 5, $5; No. 3C, $2 ....dis 20 %
Lewis' Patent Single Twist ....dis 45 %
Russell Jennings' Augers and Bits ....dis 25 %
Imitation Jennings' Bits (new list) ....dis 60@65&5 %
Pugh's Black ....dis 20 %
Car Bits ....dis 50&10&60 %
L'Hommedieu Car Bits ....dis 15&10 %
Forstner Pat. Auger Bits ....dis 10 %

Hollow Augers—
Ives
French, Swift & Co.
Douglass'
} dis 25&10 @ 25&10&5 %

Bonney's Adjustable ₩ doz. $48 ....dis 40&10 %
Stearns' ....dis 20&10 %
Ives' Expansive, each $4.50 ....dis 50&10 %
Universal Expansive, each $4.50 ....dis 20 %
Wood's ....dis 25 @ 25&10 %

Expansive Bits—
Clark's small, $18; large, $26 ....dis 35 @ 35&5 %
Ives' No. 4, per doz., $60 ....dis 35 @ 40 %
Swan's ....dis 40 %
Steer's, No. 1, $26; No. 2, $22 ....dis 35 %
Stearns' No. 2, $48 ....dis 20 %

Gimlet Bits—
Common ....₩ gross $2.75 @ $3.25
Diamond ....₩ doz. $1.10, dis 25&10 %
"Bee" ....dis 25 @ 25&5 %
Double Cut, Shevardson's ....dis 45 @ 45&5 %
Double Cut, Ct. Valley Mfg. Co. ....dis 30&10 %
Double Cut, Hartwell's, ₩ gro. $5.25
Double Cut, Douglass' ....dis 40&10 %
Double Cut, Ives' ....dis 60 @ 60&5 %

Bit Stock Drills—
Morse Twist Drills ....dis 50&10&5 %
Standard ....dis 50&10&5 %
Cleveland ....dis 50&10&5 %
Syracuse, for metal ....dis 50&10&5 %
Syracuse, for wood (wood list) ....dis 30 @ 30&5 %
Williams' or Holt's, for metal ....dis 50&10&10 %
Williams' or Holt's, for wood ....dis 40&10 %

Ship Augers and Bits—
L'Hommedieu's ....dis 15&10 %
Watrous's ....dis 15&10 %
Snell's ....dis 15&10 %
Snell's Ship Auger Patt'n Car Bits, dis 15&10 %
} Extras often given.

Awl Hafts.

Sewing, Brass Ferrule ....$3.50 ₩ gross—dis 45&10 %
Patent Sewing, Short ....$1.00 ₩ doz—dis 40&10 %
Patent Sewing, Long ....$1.20 ₩ doz.—net
Patent Peg, Plain Top ....$10.00 ₩ gross—dis 45&10 %
Patent Peg, Leather Top ....$12.00 ₩ gross—dis 45&10 %

Awls, Brad Sets, &c.

Awls, Sewing, Common ....₩ gross $1.70—dis 35 %
Awls, Shouldered Peg ....₩ gross $2.45—dis 40@40&10 %
Awls, Patent Peg ....₩ gross 63¢—dis 40@40&10 %
Awls, Shouldered Brad ....$2.70 ₩ gross—dis 35 %
Awls, Handled Brad ....$7.50 ₩ gross—dis 45 %
Awls, Handled Scratch ....$7.50 ₩ gross—dis 35&10 %
Awls, Socket Scratch ....$1.50 ₩ doz—dis 25 @ 30 %

Awl and Tool Sets.

Aiken's Sets, Awls & Tools, No. 20, ₩ doz. $10—dis 55&10 %
Gray's Ad Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9 ....dis 25&25&10 %
Miller's Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18 ....dis 25 %
Henry's Combination Haft ....₩ doz. $6
Brad Sets, No. 42, $10.50. No. 43, $12.50 ....dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50.
Brad Sets, Stanley's Excelsior, No. 2, $4.00.
Brad Sets, Stanley's Excelsior, No. 3, $5.50.
} dis 30&10 %

Axes.

Makers' and Special Brands—
First quality ....₩ doz. $6.00 @ $6.50
Others ....₩ doz. $5.50 @ $5.75

Axle Grease.

Fraser's, in bulk ....Keg ₩ ℔, 4¢; Pail, ₩ ℔, 5¢ net
Fraser's, in boxes ....₩ gross $9.50
Dixon's Everlasting, in bxs., ₩ doz., 1 ℔: $1.20; 2 ℔, $2
Dixon's Everlasting ....10-℔ pails, each, 85¢
Lower grades, special brands ....₩ gro $5.50 @ $7

Axles.—No. 1, 4¢ @ 4¼¢ No. 2, 5¼ @ 5½¢.

Nos. 7 to 18 ....dis 50&55 %
Nos. 19 to 22 ....dis 60&10&10@70 %
National Wrought Steel Tubular Self-Oiling:
Standard Farm (1 to 5) and Special Farm (A1 to A5)
Less than 10 sets ....dis 33⅓ %
Over 10 sets ....dis 33⅓&25 %
X Strong Exp. (6 to 9), & XX Strong Truck (10 to 16):
Less than 10 sets ....dis 10 %
Over 10 sets ....dis 10&5 %

Bag Holders.

Sprengle's Pat., ₩ doz $18 ....dis 60 %

Balances.—Spring Balances ....dis 50 %
Common Scale Beams ....₩ doz., $1.50—dis 50 %
Chatillon's Spring Balances ....dis 50 %
Chatillon's Circular Spring Balances ....dis 60 %

Bells.

Hand—
Light Brass ....dis 70&10 %
Extra Heavy ....dis 60&10 %
White Metal ....dis 60&10&10 %
Silver Chime ....dis 33⅓&10 %
Globe (Cone's Patent) ....dis 25&10 @ 35 %

Door—
Gong, Abbe's ....dis 33⅓&10 %
Gong, Yankee ....dis 45&10 %
Gong, Barton's ....dis 40&10 @ 50 %
Crank, Taylor's ....dis 25&10 %
Crank, Brooks' ....dis 50&10&2 %
Crank, Cone's ....dis 10 %
Crank Connel's ....dis 20&10 %
Lever, Sargent's ....dis 60&10 %
Lever, Taylor's Bronzed or Plated ....net
Lever, Taylor's Japanned ....dis 25&10 %
Lever, R. E. ₩ Co.'s ....dis 50&10&2 %
Pull, Brook's ....dis 50&10&2 %
Pull, Western ....dis 25&10 %

Cow—
Common Wrought ....dis 60&10 %
Western ....dis 20&10 %
Western, Sargent's list ....dis 70&10 %
Kentucky "Star" ....dis 20&10 %
Kentucky, Sargent's list ....dis 70&10 %
Dodge, Genuine Kentucky, new list ....dis 70@70&10 %
Texas Star ....dis 50&10 @ 50&10&5 %
Tall ....dis 40@40&5 %
Farm Bells ....₩ ℔, 3¢ @ 3½¢
Steel Alloy Church and School Bells ....dis 40 %

Bellows.—Blacksmiths' ....dis 60&10&5 @ 60 %
Molders' ....dis 40 @ 40&10 %
Hand Bellows ....dis 40&10 @ 50 %

Belting, Rubber.

Common Standard ....dis 70&10 %
Standard ....dis 70&70&5 %
Extra ....dis 60&10 %
N. Y. B. & P. Co., Standard ....dis 60&5 %
N.Y.B.&P Co., Extra Standard ....dis 50&10 %

Bench Stops.

Morrill's ....₩ doz $9—dis 50 %
Hotchkiss's ....₩ doz $5.00—dis 10 @ 10&10 %
Weston's, per doz No. 1, $10; No. 2, $9 ....dis 25&10&5 %
McGill's ....₩ doz $3—dis 10 %

Bits.—Auger, Gimlet Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders.

Extension, Barber's ....₩ doz $15.00—dis 40 @ 40&10 %
Extension, Ives' ....₩ doz $20.00—dis 60&5 @ 60&10 %
Diagonal ....₩ doz $24.00—dis 40 %
Angular ....₩ doz $24.00—dis 40&5 %

Blind Adjusters.

Domestic ....₩ per doz $3.00—dis 33⅓ %
Excelsior ....₩ doz $10.00—dis 50&10&2 %
Washburn's Self-Locking ....dis 20 @ 20&10 %

Blind Fasteners.

Mackrell's ....₩ doz pairs, $1.00—dis 20@20&10 %
Van Sand's Screw Pattern ....$15 ₩ gro.—dis 60&10 %
Van Sand's Old Pattern ....$15 ₩ gro.—dis 55&10 %
Washburn's Old Pattern ....$9 ₩ gro. net
Merriman's ....new list, net
Austin & Eddy No. 2008 ....$9 ₩ gro. net
Security Gravity ....$9 ₩ gro. net

Blind Staples.

Barbed, ½ in. and larger ....₩ ℔ 7½ @ 8¢ net
Barbed, ⅜ in. ....₩ ℔ 8½ @ 9¢ net

Blocks.

Ordinary Tackle, list April 17, '85 ....dis 40 %
Cleveland Block Co., Mal. Iron ....dis 50 %
Novelty Tackle Blocks, Mal. Iron ....dis 50 %

Bolts.

Door and Shutter—
Cast Iron Barrel, Square, &c. ....dis 70 @ 70&10 %
Cast Iron Shutter Bolts ....dis 70 @ 70&10 %
Cast Iron Chain (Sargent's list) ....dis 65&10 %
Ives' Patent Door Bolts ....dis 60 %
Wrought Barrel ....dis 70 @ 70&10 %
Wrought Square ....dis 70 @ 70&10 %
Wr't Shutter, all Iron, Stanley's list ....dis 60&10 %
Wr't Shutter, Brass Knob, Stanley's ....dis 40&10 %
Wrought Shutter, Sargent's list ....dis 60&10 %
Wrought Sunk Flush, Sargent's list ....dis 55&10 %
Wrought Sunk Flush, Stanley's list ....dis 50&10 %
Wrought B. K. Flush, Com'n Stanley's list ....dis 55&10 %

Carriage—
Com. list June 10, '84 ....dis 75&2½&2 %
Genuine Eagle, list Oct., '84 ....dis 70&10 %
Phila. pattern, list Oct. 7, 84 ....dis 75&10@75&10&5 %
R. B. & W. old list ....dis 70 %

Fire—
Common, list Feb. 28, 1883 ....dis 70 %
P. C. B. & N. Co., Empire, list Feb. 28, 1883 ....dis 70 %
P. C. B. & N. Co., Philadel., list Oct. 84 ....dis 82½ %
P.C.B.&N.Co., Keystone, Phil. list Oct. '84 ....dis 80 %
P.C.B.&N.Co., Norway, Phil. list, Oct. '84 ....dis 75&10 %
Am. S. Co., Norway, Phil., list Oct. 16, '84 ....dis 75&10 %
Am. S. Co., Eagle, Phil., list Oct. 16, '84 ....dis 80 %
Am. S. Co., Philadel. list, Oct. 16, 84 ....dis 82½ %
Am. S. Co., Bay State, list Feb. 28, '83 ....dis 70 %
R. B. & W., Philadel. list Oct. 16, 1884 ....dis 82 %
R. & E. Mfg. Co. ....dis 70 %

Stove and Plate—
Stove ....dis 62½ %
Plow ....dis 60&5 %
Am. S. Co. Stove, Annealed ....dis 62½ %
R. B. & W., Plow ....dis 55 %
R. B. & W., Stove ....dis 62½ %
R. & E. Mfg. Co. Stove ....dis 62½ %
Machine, according to size ....dis 75&10 @ 80 %
Bolt Ends, according to size ....dis 75&10 @ 80 %

Borax ....₩ ℔ 9½@10½¢

Boring Machines.

Without Augers.	Upright.	Angular.
Douglass	$5.50	$6.75 ....dis 50 %
Snell's, Rice's Patent	5.50	6.75, dis 40&10&10 %
Jennings	5.50	6.75, dis 45@45&10%
Other Machines	2.35	2.75 ....net
Phillips' Pat., with Augers	7.00	7.50 ....net

Bow Pins

Humason, Beckley & Co.'s ....dis 60&10 %
Sargent & Co.'s ....$17 and $18, dis 60&10 %
Peck, Stow & W. Co. ....dis 50&10 @ 50&10&5 %

Braces.

Backus, Nos. 110 to 114 and 31 to 33, ...dis 60&5@60&10%
Backus, Nos. 6, 8, 12, 14 ....dis 60&10&5 %
Backus, Nos. 16, 18, 20, 29, 7 9, 11 ....dis 70&10&5 %
Barber's, Nos. 10 to 16 ....dis 50 %
Barber's, Nos. 30 to 33 ....dis 50 %
Barber's, Nos. 40 to 63 ....dis 50&10 %
Barker's, Nos. 8, 10 and 12 ....dis 75&10@80 %
Barker's, Plated, Nos. 8, 10 and 12 ....dis 65&10&70 %
Osgood's Ratchet ....dis 40&10@50 %
Spofford's ....dis 50&10 %
Ives' New Haven Novelty ....dis 70 @ 70&5 %
Ives' New Haven Ratchet ....dis 6..&5 @ 60&10 %
Ives' Barber Ratchet ....dis 60&5 @ 60&10 %
Ives' Barbers ....dis 60&5 @ 60&10 %
Ives' Spofford ....dis 60&5 @ 60&10 %
Common Ball, American ....$1.10 @ $1.15
Bartholomew's, Nos. 25, 27, 30 ....dis 50&10@60&5 %
Bartholomew's, Nos. 117 118 119 ....dis 70 @ 70&5 %
Amidon's Barker's Imp'd Pla'n ....dis 75&10 @ 80 %
Amidon's Barker's Imp. Nickeled ....dis 65&10 @ 70 %
Amidon's Ratchet ....dis 75&10 @ 80 %
Amidon's Eclipse Ratchet ....dis 60 %
Amidon's Globe Jawed ....dis 40&40&10 %
Amidon's Corner Brace ....dis 40 @ 40&10 %
Am'don's Universal ....8 in., $2.10; 10 in., $2.25
Amidon's Buffalo Ball ....$1.10 @ $1.15
P. S. & W. ....dis 50&10 %

Brackets.

Shelf, plain, Sargent's list ....dis 55&10 @ 55&10&10 %
Shelf, fancy, Sargent's list ....dis 60&10 @ 60&10&10 %
Reading, plain ....dis 60&10 @ 60&10&5 %
Reading, Rosette ....dis 60&10 @ 60&10&10 %

Bright Wire Goods. ....dis 87½ @ 87½&10 %

Broilers.	Inch.	₩ 10	₩ x 11
Henis' Self-Basting	Per doz.	$4.50 5.50	6.50

Buckets.—See Well Buckets and Pails.

Bull Rings.—Union Co. Nut ....dis 55 %
Sargent's ....dis 66⅔&10 @ 70&5 %
Hotchkiss' low list ....dis 30 %
Humason, Beckley & Co.'s ....dis 70 %
Peck, Stow & W. Co.'s ....dis 50&10 @ 50&10&10 %
Ellrich Hdw. Co., White Metal, low list ....dis 50@50&10 %

Butcher's Cleavers.

Bradley's ....dis 25 @ 30
L. & I. J. White ....dis 20&5 %
Beatty's ....dis 40 @ 40&5%

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s ....dis 40
P. S. & W ....dis 33⅓&5@33⅓&10

Butts.

Brass—
Wrought Brass ....dis 70@70&10 %
Cast Brass, Tiebout's ....dis 33⅓ %
Cast Brass, Corbin's Fast ....dis 33⅓&10 %
Cast Brass, Loose Joint ....dis 33⅓&10 %

Cast Iron—
Fast Joint, Narrow ....dis 50&10
Fast Joint, Broad ....dis 55&10
Loose Joint
Loose Joint, Japanned
Loose Joint, Jap. with Acorns
Parliament Butts
Mayer's Hinges
Loose Pin, Acorns
Loose Pin, Acorns, Japanned
Loose Pin, Acorns, Jap, Pltd. Tips
} ....dis 70&10

Wrought Steel—
Fast Joint, Narrow ....dis 70&10 %
Fast Joint, Lt. Narrow ....dis 70&10 %
Fast Joint, Broad ....dis 70&10 %
Loose Joint, Broad ....dis 70&10 %
Table Butts, Back Flaps, &c ....dis 70&10 %
Inside Blind, Regular ....dis 70&10 %
Inside Blind, Light ....dis 70&10 %
Loose Pin ....dis 70&10 %
Bronzed Wrought Butts ....dis 40&10@40&10&5 %

Calipers.—See Compasses.

Calks, Toe

Gaulfer ....₩ ℔ 5½@6¢
Dewicks ....₩ ℔ 5½@6¢

Can Openers.

Messenger's Comet ....₩ doz $3.00, dis 25 %
American ....₩ gross $3.00
Duplex ....₩ doz 25¢, dis 15 @ 20 %
Lyman's ....₩ doz $5.75, dis 20 %
No. 4, French ....₩ doz $2.25, dis 55 @ 60 %
No. 5, Iron handle ....₩ gross $6.00, dis 45 @ 50 %
Eureka ....₩ doz $2.50, dis 10 %
Sardine Scissors ....₩ doz $2.70@$3 00 %
Star ....₩ doz $2.75 %
Sprague, No. 1, $2; 2, $2.25; 3, $2.50 ....dis 50&10&10 %

World's Best. ₱ gross, No. 1, $12.00; No. 2, $24.00, No. 3, $36.00.....dis 50&10 %
Universal.....₱ doz $3 00, dis 35&5 %
Domestic.....₱ doz $2.50, dis 45 %
Champion.....₱ doz $2.00, dis 50 %

Cards.
Horse and Curry.....dis 10&10 @ 10&10&10 %
Cotton.....New list, Aug., 1883, dis 10 @ 10&10 %
Wool " " " dis 10 @ 10&10 %

Carpet Stretchers.
Cast Steel, Polished.....₱ doz $2.25
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Bullard's.....dis 25 @ 25&10 %

Carpet Sweepers.
Bissell No. 6.....₱ doz $17.00
Bissell No. 7 New Drop Pan.....₱ doz $19.00
Bissell Grand.....₱ doz $36 00
Grand Rapids.....₱ doz $24.00
Crown Jewel.....No. 1, $18; No. 2, $19; No. 3, $20
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Improved Parlor Queen, Nickeled Trimmings.....₱ doz $27.00
Improved Parlor Queen, Japanned Trimmings.....₱ doz $21.00
Exc lsi r.....₱ doz $22.00
Garland.....₱ doz $18.00
Parlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog Wheel.....₱ doz $16.00

Cartridges.—See Ammunition.

Casters.
Bed.....
Plate.....
Shallow Socket.....
Deep Socket.....
Yale Casters, list May, 1884.....dis 30&10&40 %
Yale, Gem.....dis 60&60&5 %
Martin's Patent (Phœnix).....dis 45&10 @ 50 %
Payson's Anti friction.....dis 60 @ 60&10 %
"Giant" Truck Casters.....dis 10 @ 10&5 %
Stationary Truck Casters.....dis 45&10

New list: Brass..dis 55 @ 55&5 %; Others..dis 60 @ 60&5 %

Cattle Leaders.
Humason, Beckley & Co.'s.....dis 70 %
Sargent's.....dis 66⅔&10 %
Hotchkiss.....dis 30 %
Peck Stow & W. Co.....dis 50&10 %

Chain.
Trace, 6½-10-2, exact sizes, ₱ pair, $1 03 } dis 50&10@
Trace, 6½-10-3, exact sizes, ₱ pair, .92 } dis 50&10&5 %
Trace 7-10-2, exact sizes.. ₱ pair, 1.11 }
NOTE.—Traces "Regular" sizes 3¢ net ₱ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1 1884.....dis 50&10 @ 50&10&5 %
American Coil 3-16 ¼ 5-16 ⅜ 7-16 ½ 9-16
In cask lots, 8.75 6.25 5.00 4.50 4.40 4.00 3.75 3.50
Less than cask lots, add ½¢@½¢ ₱ ℔.
German Coil, list of June 20, 1887...dis 50&10&5@60 %
Ger. Halter Chain, list of June 20, 1887.....dis 50&10&5@60 %
Covert Halter, Hitching and Breast.....dis 50&2 %
Covert Traces.....dis 35@2 %
Oneida Halter Chain.....dis 60 @ 60&5 %
Galvanized Pump Chain.....₱ ℔ 5½¢ @ 6¢
Jack Chain, Iron.....dis 70&10 @ 75 %
Jack Chain, Brass.....dis 65 @ 70 %

Chalk.—White.....₱ gro 50¢
Red.....₱ gro 70¢
Blue.....₱ gro 87¢
White Crayons.....₱ gro 12¢ @ 12½ dis 10¢

Chalk Lines.—See Lines.

Chisels.
Socket Framing and Firmer—
P., S. & W.....
New Haven and Middlesex.....
Mix.....
Ohio Tool Co.....
Buck Bros.....dis 30 %
Merrill.....dis 60&10@60&10&5 %
L. & I. J. White.....dis 30 @ 30&5 %
Witherby and Douglass.....dis 75 & 75&5 %
Tanged Firmers.....dis 40&10 %
Tanged Firmers, Butcher's.....$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's.....$5.00 to £
Tanged Firmers, Buck Bros.....dis 30 %
Cold Chisels, ₱ ℔.....16¢ @ 19¢

dis 75&5 @ 75&10 %

Chucks.
Beach Patent.....each, $8.00, dis 20 %
Morse's Adjustable.....each, $7.00, dis 20 @ 20&5 %
Danbury.....each, $6.00, dis 30 @ 30&5 %
Syracuse, Bals Pat.....dis 25 %

Clamps.
Providence Tool Co.'s Wrought Iron.....dis 25 %
Adjustable, Gray's.....dis 20 %
Adjustable, Lambert's.....dis 20 %
Adjustable, Snow's.....dis 40&5 %
Adjustable, Hammer's.....dis 15 %
Adjustable, Stearns'.....dis 20&10 %
Stearns' Adjustable Cabinet and Corner...dis 20&10 %
Cabinet Sargent's.....dis 60&10&10 %
Carriage Makers', Sargent's.....dis 70&10 %
Eberhard Mfg. Co.....dis 40&5 @ 40&10 %
Warner's.....dis 40&10 @ 40&10&5 %
Saw Clamps.....See Vises

Clips.
Norway, Axle, ¼ & 5-16.....dis 55&5&5
Second grade Norway Axle, ¼ & 5 16.....dis 65&5
Superior Axle Clips.....dis 66⅔&5 @ 66⅔&10&5 %
Norway Spring Bar Clips, 5-16.....dis 60&5&5
Wrought-Iron Felloe Clips.....₱ ℔ 5½¢
Steel Felloe Clips.....₱ ℔ 5¢
Baker Axle Clips.....dis 25 %

Cockeyes......dis 50 %

Cocks, Brass.—Hardware list.....dis 40&10&2 %

Coffee Mills.
Box and Side, List revised Jan. 1, 1888.....dis 50&2 %
American Enterprise Mfg Co.....dis 20&10&30 %
The "Swift," Lane Bros.....dis 20&10 %

Compasses, Dividers, &c.
Compasses, Calipers, Dividers.....dis 70@70&10 %
Bemis & Call Co.'s Dividers.....dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers.....dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside.dis 50&5 %
Bemis & Call Co.'s Double.....dis 60 %
Bemis & Call Co.'s (Call's Patent Inside).....dis 30 %
Excelsior.....dis 50 %
J. Stevens & Co.'s Calipers and Dividers.....dis 25&10 %
Starrett's Spring Calipers and Dividers dis 25&10& 0 %
Starrett's Lock Calipers and Dividers.....dis 25 1 %
Starrett's Combination Dividers.....dis 25&10 %

Coopers' Tools.
Bradley's.....dis 20 %
Barton's.....dis 20@20&5 %
L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %
Beatty's.....dis 40 @ 40&5 %
Sandusky Tool Co.....dis 30 @ 30&5 %

Corkscrews.
Humason & Beckley Mfg. Co.....dis 40 @ 40&10 %
Clough's Patent.....dis 33⅓ @ 33⅓&5 %
Howe Bros. & Hulbert.....dis 35 %

Corn Knives and Cutters.
Bradley's.....dis 10 %
Wadsworth's.....dis 25 %

Cradles.—Grain.....₱ ℔ 4¢

Crow Bars.—Cast Steel.....₱ ℔ 4¢
Iron, Steel Points.....₱ ℔ 3½¢

Curry Combs.
Fitch's.....dis 50&10 @ 50&10&10 %
Rubber.....₱ doz $10.00, dis 20 %
Perfect.....dis %

Curtain Pins.—Silvered Glass.....net
White Enamel.....net

Cutlery.
Beaver Falls and Booth's.....dis 33⅓ %
Wostenholme.....$7.75 to £

Dampers, &c.
Dampers, Buffalo.....dis 50 %
Buffalo Damper Clips.....dis 50 %
Crown Damper.....dis 40 %
Excelsior.....dis 40&10 %

Dividers.—See Compasses.

Dog Collars.
Embossed Glit, Pope & Stevens' list.....dis 30&10 %
Leather, Pope & Stevens' list.....dis 40 %
Brass, Pope & Stevens' list.....dis 40 %

Door Springs.
Torrey's Rod, regular size.....₱ doz $1.30
Gray's.....₱ gro, $20.00, dis 20 %
Bee Rod.....₱ gro, $20.00, dis 20 %
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30, dis 40&10&5 %
Gem Coil, list April 19 1886.....dis 10 %
Star Coil, list April 19, 1886.....dis 20 %
Victor (Coil).....dis 60 @ 60&10 %
Champion (Coil).....dis 60&10 @ 60&10&10 %
Philadelphia.....5 in., $5.00; 8 in., $7.75, dis 30 %
Cowell's.....No. 1, ₱ doz $18.00; No. 2, $15.00, dis 50 %
Rubber, complete.....₱ doz $4.50, dis 55&10 %
Hercules.....dis 50 %
Shaw Door Check and Spring.....dis 25 @ 30 @ 35 %
Elliott's Door Check and Spring.....dis 25 %

Drawing Knives.
P. S. & W.....
Mix.....
New Haven and Middlesex.....
Merrill.....dis 60&10&10 %
Witherby and Douglass.....dis 75@75&5 %
Watrous.....dis 15&10 @ 25 %
L. & I. J. White.....dis 20&5 %
Bradley's.....dis 35 %
Adjustable Handle.....dis 25 @ 33⅓ %
Wilkinson's Folding.....dis 25 @ 25&10 %

dis 75&5 @ 75&10 %

Drills and Drill Stocks.
Blacksmiths'.....each, $1.75
Blacksmiths' Self-Feeding.....each, $7.50, dis 20 %
Breast, P. S. & W.....dis 40&10 %
Breast, Wilson's.....dis 30&5 %
Breast, Millers Falls.....each, $3.00, dis 25 %
Breast, Bartholomew's... each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's.....dis 20 @ 20 & 5 %
Ratchet, Ingersoll's.....dis 25 %
Ratchet, Parker's.....dis 20 @ 20&5 %
Ratchet, Whitney's.....dis 20&10 %
Ratchet, Weston's.....dis 20@25 %
Ratchet, Moore's Triple Action.....dis 25 & 30 %
Whitney's Hand Drill, Plain, $1.00, Adjustable, $2.00.....dis 20&10 %
Wilson's Drill Stocks.....dis 1' %
Automatic Boring Tools.....each, $1.75 @ $1.85

Twist Drills—
Morse.....dis 50&10&5 %
Standard.....dis 50&10&5 %
Syracuse.....dis 50&1C&5 %
Cleveland.....dis 50&10&5 %
Williams.....dis 50&10&10 %

Bit Stocks.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans.—Small sizes.....₱ ℔ 6¾¢
Large sizes.....₱ ℔ 6¼ ¢

Egg Beaters.
Dover.....₱ doz., $2.00
National.....₱ doz $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.).....₱ gro, $17.00@$18.00
Kingston (Standard Co.).....₱ gro, $6.50
Acme (Standard Co.).....₱ gro, $6.00
Duplex (Standard Co.).....₱ gro, $15.00
Duplex, extra heavy.....₱ doz extra $5 00
Rival (Standard Co.).....₱ gro $ 2.00
Triumph (T. & S. Mfg. Co.).....₱ gro, f 10,50@$11,50
Advance No. 1.....₱ gro $10,50
Advance, No. 2.....₱ gro $10.00
Bryant's.....₱ gro $15 00
Ayres' Spiral.....₱ gro $5
Double (Hamblin & Russell Mfg. Co.).....₱ gro, $16 20
Easy (Hamblin & Russell Mfg. Co.).....₱ gro, $14.00
Triple (Hamblin & Russell Mfg. Co.).....₱ gro, $12.20
Spiral (Hamblin & Russell Mfg. Co.).....₱ gro, $4.50
Paine, Dieu & Co's.....₱ gro $4.00

Egg Poachers.
Buffalo Steam Egg Poachers, ₱ doz., No. 1, $6.00; No 2, $9.00.....dis 25 %
Electric Bell Sets.—Wollensak's.....dis 15 %
Bigelow & Dowse.....dis 20 %

Emery.

	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF FF.
Kegs, ₱ ℔	4 ¢	5 ¢	2½¢
½ kegs, ₱ ℔	4½¢	5½¢	2¾¢
¼ kegs, ₱ ℔	4¾¢	5¾¢	3 ¢
10 ℔ cans, 10 in case	6 ¢	6¾¢	5 ¢
10 ℔ cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Iron, list Nov. 11, 1885.....dis 50&10 @ 50&10&5
Brass.....dis 60 @ 60&5 %

Escutcheons.
Door Lock.....Same discounts as Door Locks
Brass Thread.....dis 60 @ 60&10 %
Wood.....dis 25 %

Faucets.
Fenn's.....dis 40 %
Bohren's Patent Rubber Ball.....dis 25 %
Fenn's Cork Stops.....dis 33⅓ %
Star.....dis 60 %
Frary's Patent Petroleum.....dis 40&5&2 %
West's Patent Key.....dis 50&10 %
Anchor Lock.....dis 45 %
Metallic Key, Leather Lined...dis 60&10 @ 60&10&10 %
Cork Lined.....dis 70&5 @ 70&10 %
Burnside's Red Cedar.....dis 50 %
Burnside's Red Cedar, bb' lots.....dis 50&10 %
J. Sommer's Peerless Best Block Tin Key.....dis 40 %
J. Sommer's IXL, 1st quality, Cork Lined.....dis 50 %
J. Sommer's Diamond Lock.....dis 40 %
J. Sommer's Perfection, Fla. Red Cedar.....dis 50 %
J. Sommer's Goodenough Cedar.....dis 60 %
Self-Measuring, Enterprise...₱ doz $36.00—dis 20&10 %
Self-Measuring, Lane's.....₱ doz $36.00—dis 25&10 %
Self-Measuring, Victor.....₱ doz $36.00—dis 25&10 %

Felloe Plates......₱ ℔ 6 @ 6½¢

Fifth Wheels.—Derby and Cincinnati..dis 45&5 %

Files.
Domestic—
Nicholson Files, Rasps, &c.....dis 60&5 @ 60&10 %
Nicholson (X. F.) Files.....dis 25 %
Nichols & Royal Files (Seconds dis 75 (extra prices on certain sizes.)
Other makers, best brands.....dis 60&5 @ 60&10&5 %
Fair brands.....dis 60&10&10 @ 70 %
Second quality.....dis 70&5 @ 70&10 %
Heller's Horse Rasps.....dis 60&7½ @ 50&10 %
McCaffrey's Horse Rasps.....dis 60&10 %
Imported—
J. & Riley Carr.....List, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps.....dis 10 %
Moss & Gamble.....List April 1, 1883, dis 15 %
Butcher.....Butcher's list, dis 20 %
Stubs.....Stubs list, dis 25 @ 30 %
Turton Bros.....Turton's list dis. 20 @ 25 %
Greaves' Horse Rasps.....American list d 60 %

Flu ing Machines.
Knox, 4½-inch Rolls.....$3.25 each } dis 35 %
Knox, 6-inch Rolls.....$3.60 each }
Eagle 3½ inch Roll.....$2.15, dis 35 %
Eagle, 5½-inch Roll.....2.85, dis 35 %
Crown, 4½ in., $3.50: 6-in, $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel.....6-in., $2.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter.....$1.50 each, net
Geneva Hand Fluter, White Metal..₱ doz $12, dis 25 %
Crown Hand Fluter, Nos 1, $15; 2, $12.50; 3, $10, dis 30 %
Shepard Hand Fluter, No. 85.....₱ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110.....₱ doz $11, dis 40 %
Shepard Hand Fluter, No. 95.....₱ doz $8, dis 40 %
Clark's Hand Fluter.....₱ doz $15.00, dis 35 %
Combined Fluter and Sad Iron...₱ doz $15.00, dis 30 %
Buffalo.....₱ doz $10.00 dis 10 %

Fluting Scissors......dis 45 %

Fodder Squeezers.
Blair's.....₱ doz $2.00
Blair's, "Climax".....₱ doz $1.25

Forks.—Hay, Manure, &c., Asso. list.....dis 65&5 %
Hay, Manure, &c., Phila. list.....dis 60 @ 60&5 %
Plated, see Spoons.

Freezers, Ice Cream.
Buffalo Champion.....dis 60&10&5 %
Shepard's Lightning.....dis 65 %
White Mountain.....dis 60 %

Fruit and Jelly Presses.
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Henis.....₱ doz $4.50
P. D. & Co.....₱ doz $4.50
Shepard's Queen City.....dis 40 %

Fry Pans.
High List.....dis 75&5 @ 75&10 %
No. 0 1 2 3 4 5 6 7 8
₱ doz. $3.75 4.70 5.30 5.95 6.55 7.50 8.75 10.00 11 25
Low List.....dis 65&10 %
No 0 1 2 3 4 5 6 7 8
₱ doz $3.00 3.75 4.25 4.75 5.25 6 00 7.00 8.00 9.00

Fuse.
Common Hemp Fuse, for dry ground.....₱ 1000 ft. $2 70
Common Cotton Fuse, for dry ground.....2.85
Single Taped Fuse, for wet ground.....4 75
Double Taped Fuse for very wet ground.....6.00
Triple Taped Fuse, for very wet ground.....7.25
Small Gutta Percha Fuse, for water.....7.50
Large Gutta Percha Fuse, for water.....12.00

Gauges.
Marking Mortise &c.....dis 60&10 %
Starrett's Surface, Center and Scratch.....dis 25&10 %
Wire, low list.....dis 10&10 @
Wire, Wheeler, Madden & Co.....dis 10 %
Wire, Morse's.....dis 50 @ 50&5 %
Wire, Brown & Sharpe's.....dis 10 @ 20 %

Gimlets.—Nail and Spike.....dis 50&10&5 %
"Eureka" Gimlets.....dis 40&10 %
"Diamond" Gimlets.....₱ gross $5.00
Double Cut, Shepardson's.....dis 45 @ 45&5 %
Double Cut, Ives'.....dis 60 @ 60&5 %
Double Cut, Douglass'.....dis 40&10 %
"Bee".....₱ gross $12, dis 25 @ 25&5 %

Glue.—Le Page's Liquid.....dis 25 @ 25&5%
Upton's Liquid.....dis 35 %
W. N. Le Page's Improved Liquid Glue..dis25 @ 25&5 %

Glue Pots
Tinned and Enameled.....dis 40&5 @ 40&10%
Family, Howe's "Eureka".....dis 40 %
Family L. W. & C.'s "Handy".....dis 50 %

Grindstones
Small at factory.....₱ ton $7.50 @ 9.0

Grindstone Fixtures.
Sargent's Patent.....dis 70&10 %
Reading Hardware Co.....dis 30&10 %

Hack Saws.—See Saws.

Halters.—Covert's, Rope, ¼-in. Jute.....dis 50&2 %
Covert's, Rope, ¼ in., Hemp.....dis 40&2 %
Covert's Adj. Rope Halters.....dis 40&2 %
Covert's Hemp Horse and Cattle Tie.....dis 50&2 %
Covert's Jute Horse and Cattle Ties.....dis 60&10&2 %

Hammers.
Handled Hammers.
Maydole's.....List Dec. 1, 1885, dis 25 @ 25&1 0%
Buffalo Hammer Co.....List Jan. 15, '87
Humason & Beckley.....Dis. 50 @ 50&
Atna Tool Co.....10 %
Fayette R. Plumb.....dis 40&10 @ 50
C. Hammond & son.....dis 40&10&50
Verree.....dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.dis 50&10 %
Nelson Tool Works.....dis 40&10 %
Warner & Nobles.....dis 30 & 25 %
Peck, Stow & Wilcox.....dis 40 %
Sargent's.....dis 33⅓&10 %
Heavy Hammers and Sledges—
3 ℔ and under.....₱ ℔ 40¢
3 to 5 ℔.....₱ ℔ 36¢ } dis 70 & 10 @ 75 %
Over 5 ℔.....₱ ℔ 30¢
Wilkinson's Smiths'.....10¼¢ @ 11¢ ₱ ℔

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ₱ doz..dis 10%
Providence Tool Co., Leg Irons, $25.00 ₱ doz....dis 10 %
Tower's.....dis 25 %
Daly's Improved Hand Cuffs: 2 Hands, Polished, ₱ doz, $48. Nickeled, $57; 3 Hands, Polished, ₱ doz. $72. Nickeled, $84.....dis 25 %

Handles.
Iron, Wrought or Cast.—
Door or Thumb.
Nos..... 0 1 2 3 4
Per doz..$0.90 1.00 1.18 1.35 1.50....dis 60&10&10
Roggin's Latches.....₱ doz, 30¢ @ 3
Bronze Iron Drop Latches.....₱ doz, 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door.....₱ doz. $1.40, dis 10&10 %
Chest and Lifting.....dis 70 %
Handles, Wood—
Saw and Plane.....dis 40&10 @ 40&10&5 %
Hammer, Hatchet, Axe, Sledge, &c.....dis 35 %
Brad Awl.....₱ gross $2.00
Hickory Firmer Chisel, assorted.....₱ gross 4.50 } dis 60 @ 65 %
Hickory Firmer Chisel, large.....₱ gross 5.00
Apple Firmer Chisel, assorted.....₱ gross 5.00 } dis 60 @ 65 %
Apple Firmer Chisel, large.....₱ gross 6.00
Socket Firmer Chisel, assorted.....₱ gross 5.00
Socket Framing Chisel, assorted.....₱ gross 5.00
J. B. Smith Co.'s Pat. File.....dis 50 %
File, assorted.....₱ gross 2.75 } dis 40 @ 40&10 %
Auger, assorted.....₱ gross 5.00
Auger, large.....₱ gross 7.00
Patent Auger, Ives'.....dis 30&10 %
Patent Auger, Douglass'.....₱ set $1.25 net
Patent Auger, Swan's.....₱ set $1.00 net
Hoe, Rake, Shovel, &c.....dis 50&10 %
Cross Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 30¢ No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles.....50¢, dis 60 %
Champion.....15¢

Hangers.
Barn Door, old patterns.....dis 60&10&10 @ 70%
Barn Door, New England.....dis 60&10&10 @ 70 %
Samson Steel Anti Friction.....dis 55 %
Orleans Steel.....dis 55 %
Hamilton Wrought Wood Track.....dis 55 %
U. S. Wood Track.....dis 55 %
Champion.....dis 60&10 %
Rider and Wooster, Medina Mfg. Co.'s list...dis 70
Climax Anti-Friction.....dis 55

Climax Steel Anti-Friction.... dis 50 %
Zenith for Wood Track.... dis 55 %
Reed's Steel Arm.... dis 50 %
Challenge, Barn Door.... dis 50 %
Sterling (improved Anti-Friction).... dis 35&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18.... dis 50&2 %
Cheritree.... dis 50&10 %
Kidder's.... dis 50&10 @ 60 %
The "Boss".... dis 60 %
Best Anti Friction.... dis 60 %
Duplex (Wood Track).... dis 60 %
Terry's Patent.... ₩ doz. pr., 4 in. $10; 5 in., $12.... dis 50&5 %
Cronk's Patent....No. 4, $12; No. 5, $14.40; No. 6, $18.... dis 50&15 @ 60 %
Wood Track Iron Clad.... ₩ ft. 10¢, dis 50&15 @ 60 %
Carrier Steel Anti-Friction.... dis50 @ 50&5 %
Architect.... ₩ set $6.00, dis 20 %
Eclipse.... dis 20&10
Feli'x.... ₩ set $4.50, dis 20 %
Richards'.... dis30@30&10 %
Lane's Steel Anti-Friction.... dis 40&10 %
The Ball Bearing Door Hanger.... dis 20&10 @ 25&10 %
Warner's Patent.... dis 20@20&10 %
Stearns' Anti-Friction.... dis 20 @ 20&10 %
Stearns' Challenge.... dis 25&10 @ 25&10&10 %
Faultless.... dis 40 @ 40&5 %
American.... ₩ set $6; dis 20&10 %
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.... dis 40 %
Paragon, Nos. 1, 2 and 3.... dis 40&10 %
Paragon, Nos. 5, 5½, 7 and 8.... dis 20&10 %
Crescent.... dis 60@60&10 %
Nickel, Cast Iron.... dis 50 %
Nickel, Malleable Iron and Steel.... dis 40 %
Scranton Anti Friction Sing e Strap.... dis 33⅓ %
Scrap on Anti-Friction Double Strap.... dis 40 %
Universal Anti Friction.... dis 40 %
Wild West, 4 in. wheel, $15; 5 in. wheel, $21.... dis 45 %
Star.... dis 40 @ 40&10&5 %
May.... dis 50&5 @ 50&10 %

Harness Snaps.—See Snaps.

Hatchets.—List Jan. 1, 1886.

Isaian Blood.... dis 35 @ 40%
Hunt's Shingling Lath and Claw.... dis 40&5 %
Hunt's Broad.... dis 40 %
Buffalo Hammer Co.... dis 40&10@50 %
Hurd's.... dis 40&10 @ 50 %
Fayette R. Plumb.... dis 40&10 @ 50 %
Wm. Mann, Jr., & Co.... dis 50 @ 50&5 %
Underhill Edge Tool Co.... dis 40&5 @ 40&10 %
Underhill's Haines and Bright goods.... dis 33⅓ %
C. Hammond & Son.... dis 40&10 @ 50 %
Simmons.... dis 40&10 @ 50 %
Peck's.... dis 40&10 @ 40&10&5 %
Kelly's.... dis 50@50&5 %
Sargent & Co.... d's 50 %
Ten Eyck Edge Tool Co.... dis 40&10@40&10&5 %
Collins, following list.... dis 40 %

Shingling, Nos. 1 2 3....	₩ doz	$5.50	$6.00 $6.50
Claw, Nos. 1 2 3....	₩ doz	6.00	6 50 7.00
Lathing Nos. 1 2 3....	₩ doz	5.50	6.00 6.50

Hay Knives.

Lightning.... Mfrs. price ₩ doz $18, dis 25 % Jobber's Extras
Electric.... ₩ doz $17 } dis 30 @
Gem.... ₩ doz $18 } 30&5%
Wadsworth's.... dis 40&7½ @ 40&10 %
Carter's Needle.... ₩ doz $11.50 @ $12.00
Heath's.... ₩ doz $13.50 @ $14.00

Hinges.

Wrought Iron Hinges—

Strap and T.... dis 70&10&5 @ 70&10&10 %
Screw Hook and Strap.... { 6 to 12 in. ₩ ₩.... 3½¢ ; 14 to 20 in. ₩ ₩.... 3½6 ; 22 to 36 in. ₩ ₩.... 2¾¢
Heavy Welded Hook { 6 to 12 in., ₩ ₩.... 3½¢ ; 14 to 20 in., ₩ ₩.... 3½¢ ; 22 to 36 in., ₩ ₩.... 2¾¢
Screw Hook and Eye.... { ⅜ in.... ₩ doz $1.50 ; ½ in.... ₩ doz $2.45 ; ⅝ in.... ₩ doz $3.80 } 10%
Rolled Blind Hinges, Nos 32 and 34.... dis 50&10
Rolled Blind Hinges, Nos. 232 and 234.... dis 55&10 %
Rolled Plate.... dis 70&10
Rolled Raised.... dis 70&10
Plate Hinges { 8, 10 & 12 in., ₩ ₩.... 5 ; "Providence" } over 12 in., ₩ ₩.... 4

Spring Hinges—

Geer's Spring and Blank Butts.... dis 40
Union Spring Hinge Co.'s list, March. 1886.... dis 20
Acme and U. S.... dis 30
Empire and Crown.... dis 20 %
Hero and Modern.... dis 50 %
American, Gem, and Star, Japanned.... dis 20 %
American, Gem, and Star, Bronsed.... net
Oxford, Bronze and Brass.... net
Barker's Double Acting.... dis 20&10 %
Union Mfg. Co.... dis 25 %
Bommer's.... dis 30
Buckman's.... dis 15@20 %
Chicago.... dis 30 %

Gate Hinges—

Western.... ₩ doz $4.40, dis 55
N. E.... ₩ doz $7.00, dis 55 %
N. E. Reversible.... ₩ doz $5.20, dis 55&10 %
Clark's, Nos. 1 2 3.... dis 60@10&5 %
N. Y. State.... ₩ doz $5.00, dis 55&10 %
Automatic.... ₩ doz $12.50, dis 50 %
Common Sense.... ₩ doz pair $4.50, dis 50 %
Seymour's.... dis 45&10 %
Shepard's.... dis 60&10&5 %
Reed's Latch and Hinges.... ₩ doz sets $12, dis 50

Blind Hinges—

Parker.... dis 75&2 %
Palmer.... dis 50&5&10 %
Seymour.... dis 70&2 %
Nicholson.... dis 45&10 %
Huffer.... dis 50 %
Clark's, Nos. 1, 3, 5, 40 and 50.... dis 75&10&5&80 %
Clark's Mortise Gravity.... dis 50 %
Sargent's, Nos. 1, 3, 5, 11, 13.... dis 75&10@75&10&5 %
Sargent's No. 12.... dis 75&10&10 %
Reading's Gravity.... dis 75&10 @ 75&10&5 %
Shepard's Noiseless Sugars Buffalo, Champion, Steamboat, Clark's Old Pattern and Clark's Tip Pattern.... dis 70&10&5
Shepard's O. S., Lull & Porter.... dis 75 %
Shepard's Acme, Lull & Porter.... dis 75&5 %
Shepard's Queen City Reversible.... dis 75 %
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.... dis 75&10&2½ %
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50.... dis 25&2 %

Hoes.

Handled—

Garden, Mortar, &c.... dis 65&5 %
Planter's, Cotton, &c.... dis 65&5 %
Warren Hoe.... dis 65 %
Magic.... ₩ doz $4.50

Eye—

D. & H. Scovil.... dis 20
Lane's Crescent Scovil Pattern.... dis 40 %
Lane's Crescent Planters Pattern.... dis 45 & 5 %
Lane's Razor Blade, Scovil Pattern.... dis 30 %
Maynard, S. & O. Pat.... dis 45&5
Sandusky Tool Co., " " .... dis 60 %
Hubbard & Co., " " .... dis 60 %
Bare " " .... dis 60 %
Grub.... dis 60 @ 60&10 %

Hog Rings and Ringers.

Hill's Improved Ringers.... ₩ doz. $4.50
Hill's Old Style Ringers.... ₩ doz. $3.00
Hill's Tongs.... ₩ doz. $4.50
Hill's Rings.... ₩ doz boxes, $2.25 @ 2.40
Perfect Rings.... ₩ doz boxes $1.75 @ 2.00
Perfect Ringers.... ₩ doz. $2.50
Blair's Hog Ringers.... ₩ doz. $2.60 @ $2.65
Tate's Hog Rings.... ₩ doz 90¢ @ 1.00
Champion Ringers.... ₩ doz $2.00
Champion Rings, Double.... ₩ doz $2.25
Brown's Ringers.... ₩ doz, $2.00
Brown's Rings.... ₩ doz, $1.25 @ 1.30

Hoisting Apparatus.

"Moore's" Hand Hoist, with Lock Brake.... dis 20 %
"Moore's" Differential Pulley Block.... dis 40 %

Holders, File and Tool.

Balz Pat.... ₩ doz $4; dis 25 %
Nicholson File Holders.... dis 20 %

Hollow-Ware.

Iron—

Stove Hollow-Ware, Ground.... dis 60&10@60&10&5 %
Stove Hollow-Ware, Unground.... dis 70&5@70&10 %
Enameled and Tinned Hollow-Ware—
Kettles.... dis 70 @ 70&5
Oval Boilers, Saucepans & Glue Pots.... dis 40&5 @ 40&10 %
Gray Enameled Ware.... dis 40 @ 40&5 %
Agate and Granite Ware.... dis 25 %
Rustless Hollow-Ware.... dis 50 @ 50&5 %
Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Silver Plated—4 mo. or 5 % oash in 30 days.

Reed & Barton.... dis 40&5 %
Meriden Brittania Co.... dis 40&5 %
Simpson, Hall, Miller & Co.... dis 40&5 %
Rogers & Brother.... dis 40&5 %
Hartford Silver Plate Co.... dis 40&5&5 %
William Rogers Mfg. Co.... dis 40&5&5 %

Hooks.

Cast Iron—

Bird Cage, Sargent's list.... dis 60&10&10 %
Bird Cage, Reading.... dis 60&10&10 %
Clothes Line, Sargent's list.... dis 60&10&10
Clothes Line, Reading list, dis 60&10 @ 60&10&10
Ceiling, Sargent's list.... dis55&10&10 %
Harness, Reading list.... dis 55&10 @ 55&10&10
Coat and Hat, Sargent's list.... dis 55&10 @ 60&10 %
Coat and Hat, Reading.... dis 50&10 @ 50&10&10 %

Wrought Iron—

Cotton.... ₩ doz $1.25
Cotton Pat. (N. Y. Mallet & Handle W'ks).... dis 30 %
Tassel and Picture (T. & S. Mfg. Co.).... dis 50 %
Wrought Staples, Hooks, &c.... See Wrought Goods
Bench Hooks.... See Bench Stops

Wire—

Wire Coat and Hat, Gem, list April, 1886.... dis 45 %
Wire Coat and Hat Miles', list April, 1886.... dis 45
Indestructible Coat and Hat.... dis 45 %
Wire Coat and Hat, Standard.... dis 45 %
Belt.... dis 75&10 @ 80 %
Grass.... ₩ doz $2.00
Sush.... dis 55 @ 60
Whiffletree—Patent.... dis 55 %
Hooks and Eyes—Malleable Iron.... dis 70 @ 70&10 %
Hooks and Eyes—Brass.... dis 60@10&10 %
Fish Hooks, American.... dis 50 %

Horse Nails.

Nos.	6	7	8	9	10	
Ausable	.28¢	26¢	25¢	24¢	23¢	dis 25&10@25&10&10 %
Clinton, Fin	.24¢	22¢	21¢	20¢	19¢	dis 40&10 @ 50 %
Essex	.28¢	26¢	25¢	24¢	23¢	dis25&10 @25&10&10
Lyra	.28¢	26¢	25¢	21¢	20¢	dis 40&10&5 @50 %
Snowden	.25¢	23¢	22¢	21¢	20¢	dis 40&10&5@50 %
Putnam	.24¢	22¢	21¢	20¢	19¢	dis 50&10&25@25 %
Vulcan	.23¢	21¢	20¢	19¢	18¢	dis 12½@5
Northwest'n	.25¢	23¢	22¢	21¢	20¢	dis 10&10&5
Globe	.28¢	21¢	20¢	19¢	18¢	dis 12½@5&5
A. C.	.25¢	23¢	22¢	21¢	20¢	dis 25&10 @ 25&10&5 %
C. B.-K.	.25¢	23¢	22¢	21¢	20¢	dis 25&10 @ 33⅓@5
Champlain	.28¢	26¢	25¢	24¢	23¢	dis25&10&10 %
New Haven	.28¢	26¢	25¢	24¢	23¢	dis25&10@25&10&10 %
Saranac	.23¢	21¢	20¢	19¢	18¢	dis 30&10 %
Champion	.25¢	23¢	22¢	21¢	20¢	dis 10&10&10
Capewell	.28¢	26¢	25¢	24¢	23¢	dis 35&5 @ 35&10
Star	.23¢	21¢	20¢	19¢	18¢	dis 40&10@10&10½ %
Anchor	.23¢	21¢	20¢	19¢	18¢	dis 35 %
Western	.23¢	21¢	20¢	19¢	18¢	dis 40&10 %
Empire Bronzed						1¢ per lb.

Horse Shoes.—See Shoes, Horse.

Hose, Rubber, competition.. 75&10 @ 75&10&5 %
Standard.... dis 70&7 &10 %
Extra.... dis 60 @ 60&10 %
N. Y. R. & P. Co., Para.... dis 35&10 %
N. Y. R. & P. Co., Extra.... dis 50 %
N. Y. R. & P. Co., Dundee.... dis 60&10&5 %

Huskers.

Blair's Adjustable.... ₩ gross $8.00
Blair's Adjustable Clipper.... ₩ gross 7.00

Ice Picks, Chisels, &c.

Am. Ice Chisel Pol'd. ....₩ doz $3.00, dis 2 @20&5 %
National Ice Chisel.... ₩ doz $6.25, dis 20 %
Novelty Ice Breakers.... ₩ doz $6.25, dis 20 %
Dunlap's Ring Picks.... ₩ doz $2.00, dis 15 %
Wood Head Picks Sargent's.... ₩ doz $1.60, dis 50&10
Iron Head Picks, Sargent's.... ₩ doz $1.25, dis 50&10 %
Ice Mallets, Pick in handle.... ₩ doz $2.00, dis 15 %
Ice Axes, Small Cast or Mall.... ₩ doz $1.25, dis 20&10 %
Comb'nation Ice Tools.... ₩ doz $2.00 ne
Acme Ice Pick and Tongs.... ₩ gross $55.00, dis 50&10 %
Roger's Lightning Ice Chisel.... ₩ gross $28.50

Ice Tongs.

Champion, S. S. & Co.... ₩ doz $4.00, dis 25&10 %
Family.... ₩ doz $2.75, dis 20@25 %

Jack Screws.—See Screws.

Kettles.

	Spun.	Stamped
Brass, 7 to 17 in., ₩ ₩....	24¢	21 ¢
Brass larger than 17 inches, ₩ ₩....	26¢	23½¢

Enameled and Tea Kettles.... See *Hollow Ware*

Keys.

Lock Asso'n list Dec. 30. 1886.... dis 50&10 @ 60&5 %
Eagle, Cabinet, Trunk and Padlock.... dis 33⅓&2 %
Hotchkiss' Brass Blanks.... dis 40 %
Hotchkiss' Copper and Tinned.... dis 40 %
Hotchkiss' Padlock and Cabinet.... dis 35 %
Patchett Bed Keys.... ₩ doz $4.00, dis 15 %

Knife Sharpeners.

Parkin's Applewood Handles.... ₩ doz $6.00, dis 40 %
Parkin's Rosewood or Cocobolo.... ₩ doz $9.00, dis 40 %

Knives.

Wilson's Butcher Knives.... dis 20 @ 25 %
Ames' Butcher Knives.... dis 20 %
Nichols' Butcher Knives.... dis 40&1
Ames' Shoe Knives.... dis 20@25 %
Ames' Bread Knives.... ₩ doz $1.50, dis 15 @ 20
Moran's Shoe and Bread Knives.... dis 20 %
Hay and Straw.... See Hay Knives
Table and Pocket.... See Cutlery

Knobs.

Door Mineral.... 65@68
Door Por. Jap'd.... 75@78¢
Door Por. Nickel.... $2.00 @ 2.25
Door Por. Plated, Nickel.... $2.00 @ 2.25
Drawer, Porcelain.... dis 55&10&10@6 &10&10 %
Hemacite Door Knobs, new list.... dis 40&10@50 %
Yale & Towne Wood Knobs, list Dec., 1885.... dis 40 %
Furniture Porcelain.... 75¢ gross inch dis 10 %
Furniture, Wood Screws.... dis 25&10 %
Base, Rubber Tip.... dis 70&10&5 %
Picture, Judd's.... dis 60&10&10 @ 70 %
Picture, Sargent's.... dis 70 &10 %
Picture, Hemacite.... dis 35&5 %
Shutter, Porcelain.... dis 65&10 %
Carriage, Japanned.... ₩ gross 80¢, dis 60&10 %

Ladies.

Melting, Sargent's.... dis 55&10%
Melting, Reading.... dis 35&10%
Melting, Monroe's Patent.... ₩ doz. $4.00, dis 40%
Melting, P. S. & W.... dis 35&10 @ 40%
Melting, Warner's.... dis 30%

Lawn Mowers.

Standard List.... dis 50&10 %
Enterprise.... dis 60&10 %

Lanterns.

Tubular, Plain, with Guards.... ₩ doz $4 00 @ $4.25
Tubular, Lift Wire, with Guards.... ₩ doz $4 50 @ $4.75
Tubular, Square Plain, with Guards, ₩ doz $4.00 @ $4.25
Tubular, Sq Lift Wire with Guards, ₩ doz $4.25 @ $4.50
Without Guards, 25¢ ₩ dozen less.
Police, Small, $6.00; Med. $7.25; Large, $9.75, dis 20@25¢

Lemon Squeezers.

Porcelain Lined, No. 1.... ₩ doz. $6.00, dis 25&30 %
Wood, No. 2.... ₩ doz. $3.00, dis 35 %
Wood, Common.... ₩ doz $1.70 @ 1.75
Dunlap's Improved.... ₩ doz. $3.75, dis 20 @
Jammis.... No. 1, $5; 2, $9; 12, $15 ₩ doz. dis 25&10 @
Jennings' "Star".... ₩ doz $2.50
The "Boss".... ₩ doz $2.50
Dean's.... Nos. 1, ₩ doz $6.50; 2, $3.35; 3, $1.90
Little Giant.... dis 50 @ 50&5 %
King.... dis 40&5 %

Lines.

Cotton and Linen Fish, Draper's.... dis 50 %
Draper's Chalk.... dis 60 %
Draper's Mason's Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.. dis 25 %
Cotton Chalk.... dis 55 %
Samson, Cotton, No. 4, $2; No. 4½, $2.50.... dis 10 %
Silver Lake, Braided, Nos. 0, $6.00 No. 1, $6.50; No. 2, $7.00; No 3, $7.50 ₩ gross.... dis 25 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50
Masons' Colored Cotton.... dis 40
Wire Clothes, No. 18, $3.60; No 19, $3.00; No. 20, $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton.... $7.50 ₩ doz. dis 20 %

Locks, Padlocks, Cabinet Locks, &c.

Door Locks, Latches, &c.

List, Dec. 30, '86, chgd ... dis 50&10 @ 60&5 %
Mallory, Wheeler Co., list, July, 1888.. dis 50&10&60 %
Sargent & Co. list Aug 1, 1888.. dis 55&5&10 @60&10 %
Reading Hardware Co. list Feb. 2, 88.. dis 55&10&10 %
Livingston & Co.... dis 70 %
Note.—Lower net prices often made.
Perkins' Burglar Proof.... dis 60&25 %
Plate.... dis 33⅓&2 %
E. Many's "Extension Cylinder".... $10.50 ₩ doz
Barnes Mfg. Co.... dis 40 %
Yale Corrugated Key.... dis 33⅓ %
Dietz Flat Key.... dis 30 %
L. & C. Round Key Latches.... dis 30&10 %
L. & C. Flat Key Latches.... dis 33⅓&10 %
Romer's Night Latches.... dis 15 %
Yale new list.... dis 33⅓ %
"Sherardson" or "U. S."... dis 35 %
"Feiter" or "American".... dis 40&10 %
Seed's N. Y. Hasp Lock.... dis 25 %

Cabinet—

Eagle, Gaylord Parker and Corbin... } List March, '84, revised Jan. 1, '85.. dis 33⅓&2 %
Deitz, Nos. 36 to 39.... dis 40 %
Deitz, Nos. 51 to 63.... dis 40 &10 %
Dietz, Nos. 86 to 96.... dis 30 %
Stoddard Lock Co.... dis 30 @ 33⅓ %
"Champion" Night Latches.... dis 40 %
Barnes Mfg. Co.... dis 40 %
Eagle and Corbin Trunk.... dis 25&5 %
"Champion" Cabinet and Combination.... dis 33⅓ %
Yale.... dis 33⅓ %
Romer's.... dis 25 %

Padlocks—

List, Dec. 23. 84.... dis 75 @ 75&10 %
Yale Lock Mfg. Co.'s.... dis 33⅓ %
Eagle.... dis 25&2 %
Eureka, Eagle Lock Co.... dis 40&2 %
Romer's Nos 0 to 91.... dis 30 %
Romer's Scandinavian, &c, Nos. 100 to 505.... dis 15 %
A. E. Dietz.... dis 40 %
"Champion" Padlocks.... dis 40 %
Hotchkiss.... dis 30 %
"Star".... dis 45 %
"Horse Shoe." ₩ doz.. $9.... dis 40 %
Barnes Mfg. Co.... dis 40 %
Nock's.... dis 30 %
Brown's Patent.... dis 25 %
Scandinavian.... dis 90 @ 90&10 %
Fraim's Pat. Scandinavian new list (low).... dis 60 %

Lumber Tools.

Log Peavies, "Blue Line" Finish.... ₩ doz $20.00
Log Peaves, Common Finish.... ₩ doz $18.00
Steel Socket Peavies.... ₩ doz $21.00
Mall, Iron Socket Peavies.... ₩ doz $19.00
Cant Hooks, "Blue Line" Finish.... ₩ doz $16.00
Cant Hooks, Common Finish.... ₩ doz $14.00
Cant Hooks, Mall, Socket Clasp, "Blue Line" Finish.... ₩ doz $16.00
Cant Hooks, Mall, Socket Clasp Common Finish.... ₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Fin. ₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.. ₩ doz $12.00
Hand Spikes.... ₩ doz 6 ft., $15.00; 8 ft., $20
Pike Poles, Pike & Hook, 12 ft. 14 ft. 16 ft 18 ft. 20 ft. ₩ doz.... $11.50 12.50 14.50 17.50 21.50
Pike Poles, Pike only, ₩ doz.... 10.00 11.00 13.00 16.00 20.00
Pike Poles not Ironed, ₩ doz.... 6.00 7.00 9.00 12.00 16.0
Setting Poles, ₩ doz.... 14.00 15.00 17.00
Swamp Hooks.... ₩ doz $18.00
Landing Blocks.... ₩ doz $22.50
Skidding Tongs.... ₩ doz $51.00
Log Binders.... ₩ doz $26.00
Extended Boot Calks, 1 to 5 M, dis 25 %; 5 to 10 M. dis 30 %
Square Steel Boot Calks.... dis 40 %
Chain Rafting Dogs.... ₩ 100 $12.50
Ring Rafting Dogs.... ₩ 100, med., $10.00; large, $12.00
Timber Grapples.... ₩ doz $12.00

Lustre.

Four-ounce Bottles.... ₩ doz. $1.75 ₩ gro. $17.00

Mallets.

Hickory.... dis 20&10@20&10&10 %
Lignumvitæ.... dis 20&10@20&10&10 %
B. & L. Block Co., Hickory and L. V.... dis 30 @ 30&10

Match Safes.

Dangerfield's Self-Igniting.... ₩ doz $1

Mattocks.—Regular list.... dis 60&10 @ 60&10&5

Meat Cutters

Dixon's—Nos....	1	2	3	4	
₩ doz....	$14.00	17.00	19.00	30.00	—dis 45 %
Woodruff's....		Nos.	100	150	
		₩ doz	$15.00	18.00	—dis 45
Champion....	Nos.	200	300	400	
	₩ doz.	$22.00	27.00	40.00	—dis 45
Hales' Pattern Nos.	11	12	13		
₩ doz....	$27.00	33.00	45.00		dis 70 @ 70&5 %

American....					dis
Nos....	1	2	3	4B	
Each....	$5.00	7.00	10.00	25.00	50.00 60.00
Enterprise....					dis 35
Nos....	10	12	22	32	42
Each....	$3.	3.50	4.00	6 00	— 15.00

Pennsylvania.....dis 40&10%
Nos. 1 2 3 00
₩ doz. $24.00 28.00 36.00 28.00
Miles' Challenge..Nos. 1 2
₩ doz. $22.00 30.00 40.00—d'ls 45&45&10 %
Home No. 1.....$26 ₩ doz, dis 55&10 %
Draw Cut..Nos.. 5 2 6 8
Each...$50.00 75.00 80.00 225.00—dis 20 @ 25 %
Beef Shavers (Enterprise Mfg. Co.)....dis 20&10 @ 30 %
Chadborn's Smoked Beef Cutter.....₩ doz, $60.00

Mincing Knives.
Am. (2d quality), ₩ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....dis 20&10 %
Smith's, ₩ doz, Single, $2.00; Double, $3....dis 40&45 %
Knapp & Cowles.....dis 50&10&60 %
Buffalo Adjustable.....₩ doz $3.00, dis 25 %

Molasses Gates.—Stebbins' Pat..dis 70@70 & 7½ %
Stebbins' Genuine.....dis 60&10&10 %
Stebbins' Tinned Ends.....dis 40&10 %
Chase's Hard Metal.....dis 50&10 %
Bush's.....dis 20 %
Lincoln's Pattern.....dis 70 @ 70 &10 %
Weed's.....dis 20&10 %
Boss Nos.. 1 2 3 4
$7.00 8.00 9.00 10.00. ₩ doz, dis 60&10&10 %

Money Drawers.—₩ doz., $18 @ $20.

Muzzles.—Safety, ₩ doz. $3.....dis 25 %

Nails.....See Trade Report
Wire Nails & Brads, list July 14, '87..dis 70&10 %
Wire Nails, Standard Penny.....₩ keg, $2 60 @ $2.70

Nail Puller.—Curtiss Hammer... ₩ doz $9.00 net
Giant, No. 1.....₩ doz $30.00, dis10 %
Pelican.....₩ doz $9.00, dis 25 %
Boss.....₩ doz $30, dis 30 %

Nail Sets.—Square.....₩ gro., $4.00 @ $4.25
Round.....₩ gro., $3.25
Cannon's Diamond Point.....₩ gro. $12 dis 20 %

Nut Crackers.
Table (Humason & Beckley Mfg. Co.).....dis 40 %
Blake's Pattern.....₩ doz $2.00, dis 10 %
Turner & Seymour Mfg. Co.....dis 50 %

Nuts.
Nuts, all kinds, 5½¢ off list Jan. 1, 1888.
In lots less than 100 ℔, ₩ ℔, add ½¢, 1 ℔ boxes add 1¢ to list.

Oakum.
Government.....₩ ℔ 8¢
U. S. Navy.....₩ ℔ 7¢
Navy.....₩ ℔ 6¢ @ 6½¢

Oilers.—Zinc and Tin.....dis 65 @ 65&10 %
Brass and Copper.....dis 50&10&50&10&25 %
Malleable, Hammers' Improved, No 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz.....dis 10 @ 10&10 %
Malleable, Hammers, Old Pattern, same list....dis 40 %
Prior's Patent or "Paragon" Zinc....dis 60&10&10 %
Prior's Patent or "Paragon" Brass.....dis 50 %
Olmstead's Tin and Zinc.....dis 60 %
Olmstead's Brass and Copper.....dis 50 %
Broughton's Zinc.....dis 60 %
Broughton's Brass.....dis 50 %

Packing, Steam.

Rubber—
Standard.....dis 60&10 @ 50&10&10 %
Extra.....dis 50&10 @ 60 %
N. Y. B. & P.Co., Standard.....dis 50&10&5 %
N. Y. B. & P. Co., Empire.....dis 70 %
N. Y. B. & P. Co., Salamander.....₩ ℔ 65¢, dis 40 %
Jenkins' Standard.....₩ ℔ 80¢, dis 35 %

Miscellaneous—
American Packing.....10¢ @ 11¢ ₩ ℔
Russia Packing.....14¢ ₩ ℔
Italian Packing.....13 @ 14¢ ₩ ℔
Cotton Packing.....15 @ 17¢ ₩ ℔
Jute.....7 @ 8¢ ₩ ℔

Padlocks.—See Locks.

Pails.
Galvanized Iron—
Quarts..... 10 12 14
Hill's Light Weight, ₩ doz.....$2.75 3.00 3.25
Hill's Heavy Weight, ₩ doz.....3.00 3.25 3.75
Whiting's.....2.75 3.00 3.25
Sidney Shepard & Co.....2.80 ..... 3 40
Iron Clad.....2.75 3.00 3.25
Fire Buckets.....2.75 3.25 3.50
Buckets, see Well Buckets

Indurated Fibre Ware—
Star Pails, 12 qt.....₩ doz $4'50
Fire Stable and Milk, 14 qt.....₩ doz $5.50

Pencils Faber's Carpenters'.....high list dis 50 %
Faber's Round Gilt.....₩ gro $5.25 net
Dixon's Lead.....₩ gro $4.50 net
Dixon's Lumber.....₩ gro $6.75 net
Dixon's Carpenters'.....dis 40&10 %

Picks.
Railroad, 5 to 6, $12.00; 6 to 7, $13; dis 60&10&60&10 &5 %
Adze Eye, 5 to 6 $12.00; 6 to 7, $12..dis 60&10 @60&10&5 %

Picture Nails.
Brass Head, Sargent's list.....dis 50&10&10 %
Brass Head, Combination list.....dis 50&10 %
Porcelain Head, Sargent's list.....dis 50&10&10 %
Porcelain Head, Combination list.....dis 40&10 %
Niles' Patent.....dis 40 %

Pinking Irons......₩ doz 65¢ net

Pipe, Wrought Iron.—List March 23, 1887,
1¼ and under, Plain.....dis 55 %
1¼ and under Galvanized.....dis 47½ %
1½ and over, Plain.....dis 65 %
1½ and over, Galvanized.....dis 55 %
Boiler Tubes, Iron.....dis 65 %

Planes and Plane Irons.
Wood Planes—
Molding.....dis 50 &5 @ 50&10 %
Bench, First Quality.....dis 50&10 @ 60 %
Bench, Second Quality.....dis 60&10 @ 60&10&5 %
Bailey's (Stanley R. & L. Co.).....dis 30&10 %
Iron Planes—
Bailey's (Stanley R. & L. Co.)...dis 30&10&30&10&5 %
Miscellaneous Planes (Stanley R. & L. Co.dis 20&10 %
Victor Planes (Stanley R. & L. Co.)....dis 20& 10 %
Steer's Iron Planes.....dis 35 @ 35&5 %
Meriden Mal. Iron Co.'s.....dis 30&10&30&10&10 %
Davis's Iron Planes.....dis 30&10&30&10&10 %
Birmingham Plane Co.....dis 50&50&5 %
Gage Tool Co.'s Self Setting.....dis 2 %
Chaplin's Iron Planes.....dis 40 @ 40 5 %
Sargent's.....dis 30&10 @ 30& 0&10 %
Plane Irons—
Plane Irons.....dis 20&10 %
Plane Irons, Butcher's.....$5.00 @ $5.25 to £
Plane Irons, Buck Bros.....dis 30 %
Plane Irons, Auburn Tool Co.'s "Thistle".....dis 40 %
Plane Irons, Middlesex Mfg. Co., "Baldwin Iron, Single and Cut.....dis 20 @ 25 %
Double.....dis 33⅓ @ 40 %
L. & I. J. White.....dis 25 %

Pliers and Nippers.
Button's Patent.....dis 30&10 @ 40 %
Hall's Pat. Compound Lever Cutting Nippers, No. 2. 5 in., $13.50; No. 6, 7 in., $21.00 ₩ doz dis 20&10@33⅓ %
Humason & Beckley Mfg. Co.....dis 50&50&10 %
Gas Pliers.....dis 60 %
Gas Pliers, Custer's Nickel Plated.....dis 60&5 %
Eureka Pliers and Nippers.....dis 40 %
Russell's Parallel.....dis 25 %
P. S. & W. Cast Steel.....dis 50 %
P. S. & W. Tinners' Cutting Nippers....add 6 % dis 10 %
Carew's Pat. Wire Cutters.....dis 20 %
Morrill's Parallel, per doz., $12.....dis 30&5 %
Cronk's 8 in., $15; 10 in., $21.....dis 40 @ 40&5 %

Plumbs and Levels.
Regular List.....dis 70&10@70&10&10 %
Disston's.....dis 45&10 %
Pocket Levels.....dis 70&10@70&10&10 %
Davis Iron Levels.....dis 30 %
Davis' Inclinometers.....dis 10&10 %

Poppers, Corn.
Round or Square, 1 qt.....₩ gro $12 @ $15
Round or Square, 2 qt.....₩ gro $25 @ $26

Post Hole and Tree Augers and Diggers.
Samson Post Hole Digger....₩ doz $36.00, dis 25&10 %
Fletcher Post Hole Augers.....₩ doz $36.00, dis 20 %
Eureka Diggers.....₩ doz $16 @ $17
Leed's.....₩ doz $8.00 @ $9.00
Vaughan's Post Hole, Auger, per doz....$13 00 @ $14.00
Kohler's Little Giant.....₩ doz $18.00
Kohler's Hercules.....₩ doz $15.00
Kohler's New Champion.....₩ doz $9.00
Schneidler.....₩ doz $18
Ryan's Post Hole Diggers.....₩ doz $24
Cronk's Post Bars.....doz $60, dis 50&5 @ 50&10 %
Gibb's Post Hole Digger, ₩ doz $30....d's 40 @ 40&10 %

Potato Parers.
White Mountain.....₩ doz $5.00 @ 5.50
Antrim Combination.....₩ doz $8.00
Hoosier.....₩ doz $13.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw, ₩ doz $18.00.....dis 20&10 %
Disston's Pruning Hook.....₩ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Pruning Tools.....dis 40 %
Pruning Shears, Henry's Pat...₩ doz $3.75 @ $4.00 net
Henry's Pruning Shears.....₩ doz $4.25 @ $4.50 net
Wheeler, M. & Co.'s Combination...₩ doz $12, dis 20 %
Dunlap's Saw and Chise.....₩ doz $8.50, dis 30 %
J. Mallinson & Co.....No. 1, $5.25; No. 2, $7.25

Pulleys.—Hot House, Awning, &c.....dis 60&10 %
Japanned Screw.....dis 60&10 %
Brass Screw.....dis 60&10 %
Japanned Side.....dis 66⅔&10 %
Japanned Clothes Line.....dis 60&10 %
Emp're Sash Pulley.....dis 55 @ 60 %
Moore's Sash, Anti Friction.....dis 50 %

Pumps.—Cistern, Best Makers.....dis 50 @ 10&60 %
Pitcher Spout, Best Makers...dis 60&10 @ 60&10&10 %
Pitcher Spout, Cheaper Goods..dis 70&5 @ 70&10&5 %

Punches.
Saddlers' or Drive, good quality.....₩ doz 60¢ @ 65¢
Bemis & Call Co.'s Cast Steel Drive.....dis 50&5 %
Bemis & Call Co.'s Springfield Socket.....dis 50&5 %
Spring, good quality.....₩ doz $2.50 @ $2.60
Spring, Leach's Patent.....dis 15 %
Bemis & Call Co.'s Spring and Check.....dis 40 %
Solid Tinners'.....₩ doz $1.44 dis 55 %
Tinners' Hollow Punches.....dis 20&2 %
Rice Hand Punches.....dis 15 %

Rail.
Sliding Door, Wrt. Brass ₩ ℔ 35¢.....dis 15 %
Sliding Door, Bronzed Wrt. Iron.....₩ foot 7¢
Sliding Door Iron, Painted....₩ foot 4¢, dis 20&10&5 %
Barn Door, Light....Inch. ¼ ⅝ ¾
Per 100 feet.....$2.50 3.00 4.40—dis 10 %
℔ D for N. E. Hangers—
Small. Med. Large
Per 100 feet.....$2.15 2.70 3.25 net
Terry's Wrought Iron, ₩ foot.....4½¢ @ 5¢
Victor Track Rail, 7¢ ₩ foot.....dis 50&2 %
Carrick Steel Rail, per foot.....4½¢

Rakes.
Cast Steel, Association goods.....dis 65&5 %
Cast Steel, outside goods.....dis 60&10 @ 70 %
Malt.....dis 70 @ 70&5 %
Giblin Lawn Rake.....$12, dis 40 %
Canton Lawn Rake.....$6, dis 40 %
Ft. Madison Prize Bow Brace and Peerless...dis 65&5 %
Fort Madison Steel Tooth Lawn Rake, $6.....dis 25 %

Razors.—J. R. Torrey Razor Co.....dis 20%
Wostenholme and Butcher.....$10 to £, dis 10 %

Razor Strops.
Genuine Emerson.....dis 60 @ 60&5 %
Imitation Emerson.....₩ doz $2.00, dis 20&10&5 %
Torrey's.....dis 20 %
Badger's Belt and Combination.....₩ doz $2
Lamont Combination.....₩ doz $4

Rivets and Burrs.
Copper.....dis 50 @ 50&10 %
Iron, list November 17, 1887.....dis 50 @ 50&7½ %

Rivet Sets.....dis 50&2 @ 50&10 %

Rods.—Stair, Brass.....dis 25&2 %
Stair Black Walnut.....₩ doz 40¢

Rollers.
Barn Door, Sargent's list.....dis 60&10&10 %
Acme (Anti-Friction).....dis 55 %
Union Barn Door Roller.....dis 70 %

Rope.—Manufacturers' prices for large lots.
Manila.....⅝ inch and larger ₩ ℔ 11½¢ net
Manila.....⅝ inch ₩ ℔ 11½¢ net
Manila.....½ and 5-16 inch ₩ ℔ 12½¢ net
Manila Tarred Rope.....₩ ℔ 10½¢ net
Manila, Hay Rope.....₩ ℔ 11½¢ net
Sisal.....⅝ inch and larger ₩ ℔ 9½¢ net
Sisal.....⅝ inch ₩ ℔ 9½¢ net
Sisal.....½ and 5-16 inch ₩ ℔ 10½¢ net
Sisal, Hay Rope.....₩ ℔ 9½¢ net
Sisal, Tarred Rope.....₩ ℔ 8½¢ net
Sisal, Medium Lath Yarn.....₩ ℔ 8½¢ net
Cotton Rope.....₩ ℔ 15 @ 18¢ net
Jute Rope.....₩ ℔ 7¢
Discount 1½% for cash in 10 days.

Rules.
Boxwood.....dis 80&10 @ 80&10&10 %
Ivory.....dis 50 @ 50&10 %
Starrett's Rules and Straight Edges, Steel, dis 2&10 %

Sad Irons.
From 4 to 10, at factory.....₩ 100 ℔ $2.10 @ $2.55
Self Heating.....₩ doz. $9.00 net
Self Heating, Tailors'.....₩ doz. $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Pott's Irons.....dis 40&40&5 %
Enterprise Star irons, new list, July 20, 1882...dis 40 %
Combined Fluter and Sad Iron...₩ doz. $15.00, dis 15 %
Fox Reversible, Self Fluter.....₩ doz., $24.00 net
Chinese Laundry (N. E. Butt Co.).....8½¢, dis 15 %
New England.....5¢, dis 15 %
Mahony's Troy Pol. Irons.....dis 25 %
Sensible.....dis 20 @ 20&5 %

Sand and Emery Paper and Cloth.
List April 19, 1886.....dis 20@20&5 %
Sibley's Emery and Crocus Cloth.....dis 30 %

Sash Cord.
Common.....₩ ℔, 10¢ @ 11¢
Patent, good quality.....₩ ℔, 13¢ @ 13½¢
White Cotton Braided, fair quality.....₩ ℔ 28¢ @ 29¢
Common Russia Sash.....₩ ℔ 13½¢
Patent " " .....₩ ℔ 15¢
Cable Laid Italian " .....₩ ℔ 22¢ @ 23¢
India Cable Laid " .....₩ ℔ 13¢
Silver Lake, A Quality, White.....50¢, dis 10&10&5 %
Silver Lake, A Quality, Drab.....55¢, dis 10&10&5 %
Silver Lake, B Quality, White.....50¢, dis 20&10&5 %
Silver Lake, B Quality Drab.....50¢, dis 20&10&5 %
Silver Lake, C Quality, White (only).....27¢ @ 28¢
Sylvan Spring, Extra Braided, White.....34¢
Sylvan Spring, Extra Braided, Drab.....30¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson, Braided, White Cotton....50¢ dis 30 @ 30&5 %
Samson, Braided, Drab Cotton.....55¢ dis 30 @ 30&5 %
Samson, Braided Italian Hemp....55¢ dis 30 @ 30&5 %
Samson Braided Linen.....80¢ dis 30 @ 30&5

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ₩ gross.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Morris and Triumph, list Aug. 16, 1886.....dis 50&2 %
Victor.....60&10&2 %
Walker's.....dis 10 %
Attwell Mfg. Co.....dis 25 @ 33⅓ %
Reading.....dis 66⅔&10 @ 66⅔&10&10 %
Hammond's Window Springs.....dis 40 %
Common Sense, Jap'd, Cop'd and Br'zed..₩ gross $4.50
Common Sense, Nickel Plated.....₩ gross $10.00
Universal.....dis 30 %
Kempshall's Gravity.....dis 60 %
Kempshall's Model.....dis 60@60&10 %
Corbin's Daisy, list February 15, 1886.....dis 70 %
Payson's Perfect.....dis 60 @ 60&10 %
Hugunin's New and Improved Adjustable Sash Balances, list Jan. 5, 1887.....dis 25&5&2 %
Hugunin's New Sash Locks, list Jan. 5, '87.dis 25&5&2 %
Stoddard "Practical".....dis 10 %
Ives Patent.....dis 60 %
Lieschе's Nos. 100 & 110.₩ gro. $8; 105, $10.dis 20&10 %
Davis, Bronze, Barnes Mfg. Co.....dis 50 %
Champion Safety, List March 1, 1888....dis 55&5&5 %
Security.....dis 70 %

Sash Weights.
Solid Eyes.....₩ ton. $22

Sausage Stuffers or Fillers.
Miles' "Challenge".....₩ doz. $20, dis 50@50&5 %
Perry.....₩ doz. No. 1, $15; No. 0, $21, dis 50&50&5 %
Draw Cut No. 4.....each, $30.00, dis 20 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Oliver's.....dis 40&10 %

Saws.
Disston's Circular....dis 45@45&5 %
Disston's Cross Cuts..dis 45@45&5 %
Disston's Hand.....dis 25@25&5 %
Extras sometimes given by jobbers.
Atkins' Circular.....dis 50 %
Atkins' Silver Steel Diamond X Cuts.....₩ foot 70¢
Atkins' Special Steel Dexter X Cuts.....₩ foot 50¢
Atkins' Special Steel Diamond X Cuts.....₩ foot 30¢
Atkins' Champion and Electric Tooth X Cuts.....₩ foot 27 @ 28¢
Atkins' Hollow Back X Cuts.....₩ foot 18¢
Atkins' Shingle, Mulay, Drag, &c.....dis 45 %
W. M. & C., Hand.....dis 30&5 @ 30&10 %
W. M. & C. Champion X Cuts. Regular ₩ foot .24¢@26¢
W. M. & C. X Cuts. Thin Back.....₩ foot 27¢@29¢
Peace Circular and Mill.....dis 45&10 %
Peace Hand Panel and Rip.....dis 20&10 @ 20&10&10 %
Peace Cross Cuts, Standard.....₩ foot 25¢
Peace Cross Cuts, Thin Back.....₩ foot 27¢@28¢
Richardson's Circular and Mill.....dis 45 @ 45&10 %
Richardson's X-Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 24¢
Hack Saws—
Griffin's Hack Saws, complete.....dis 40&10 @ 50 %
Griffin's Hack Saw, Blades only.....dis 40&10 @ 50 %
Star Hack Saws and Blades.....dis 25 %
Diamond Hack Saws and Blades.....dis 25 %
Eureka and Crescent.....dis 25 %

Saw Frames.
White Vermont.....₩ gro $9 @ $10
Red, Polished, and Varnished....₩ doz $1.50, dis 25 %

Saw Sets.
Stillman's Genuine....₩ doz $5.00 and $7.75, dis 40&5 %
Stillman's Imita..₩ doz $3.25and$5.25,dis40&5@40&10%
Common Lever.....₩ doz $2.00, dis 40&5 %
Morrill's No. 1, $15.00; Nos. 3 & 4, $24....dis 40&10@50%
Leach's.....No. 0, $8.00; No. 1, $15.00, dis 15 @ 20 %
Nash's.....dis 20&10 @ 20&10&10 %
Hammer, Hotchkiss.....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent....dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate.....dis 10 %
Bemis & Call Co.'s Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00, dis 50&10 %
Aiken's Imitation.....$7.00, dis 50&5 %
Hart's Patent Lever.....dis 50&10 %
Disston's, Star, 5th, No. 15, $5.50,dis 20&10@20&10&10 %
Atkins' Lever.....per dos No. 1, $6.00; No. 2, $9.60
Atkins' Criterion.....per doz $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00...dis 40&10 %

Saw Tools.
Atkins Perfection.... $15.00; Excelsior $6.00 ₩ doz

Scales.
Hatch, Counter, No. 171, good quality.....₩ doz $21
Hatch, Tea, No. 161.....₩ doz $6.75 @ $7.00
Union Platform, Plain.....$2.10 @ 2.20
Union Platform, Striped.....$2.20 @ 2.30
Chatillon's "Grocers' Trip Scales.....dis 50&10 %
Chatilon's Eureka.....dis 25 %
Chetillon's Favorite.....dis 40 %
Family, Turnbull's.....dis 30@30&10

Scale Beams.
Scale Beams, List of Jan. 12, 82..dis 50&10@50&10&5 %
Chatillon's No. 1.....dis 40 %
Chatillon's No. 2.....dis 50 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.)..$6.50, dis 30&10 %
Box, 1 Handle.....₩ doz $4.00, dis 10 %
Box, 2 Handle.....₩ doz $6.00, dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 50&10@60 %
Ship, Common.....₩ doz $3.50 net
Ship, Providence Tool Co.....dis 10 %

Screen Window and Door Frames.
Porter's Pat. Window and Door Frame...dis 33⅓&10 %
Screen Corner Irons, Warner's....dis 33⅓ @ 33⅓&10 %
Stearns' Frames and Corners.....dis 25 @ 25&10 %

Screw Drivers.
Douglas Mfg Co.....dis 20&10&10 %
Disston's.....dis 45&10 %
Disston's Patent Excelsior.....dis 45&10 %
Buck Bros.....dis 30 %
Stanley R. & L. Co.'s Varnished Handles....dis 65&10 %
Stanley R. & L. Co.'s Black Handles.....dis 60&10 %
Sargent & Co.'s No. 1 Forged Shank....dis 60&10&10 %
Sargent & Co.'s Nos. 20, 40 and 60....dis 66⅔&10&10 %
Knapp & Cowles' No. 1.....dis 60&20 @ 70 %
Knapp & Cowles' No. 1 Extra.....dis 60 @ 60&10 %
Knapp & Cowles No. 00 & 4.....dis 50&5 @ 50&10&5 %
Stearns'.....dis 25&10&5 %
Gay & Parsons.....dis 35 %
Champion.....dis 2&10 %
Clark's Patent.....dis 30 @ 33⅓ %
Crawford's Adjustable.....dis 30 %
Eilrich's Socket and Ratchet.....dis 25 @ 25&10 %
Allard's Spiral, new list.....dis 25 %
Kolb's Common Sense.....₩ doz $6, dis 25&10

Syracuse Screw-Driver Bits.....dis 30 & 30&5 %
Screw Driver Bits.....₩ doz. 50¢ @ 75¢
Screw Driver Bits, Parr's.....₩ gro 6.25
Fray's Hol. Hdle. Sets, No. 3, $12.....dis. 25 @ 25 & 10 %
P. D. & Co.'s, all Steel.....dis 50 %

Screws

Wood Screws—List, Brass, Jan 27; Iron, July 1, 1887

Flat Head Iron	dis 70 %	Ex. 10 % often given by jobbers.
Round Head Iron	dis 65 %	
Flat Head Brass	dis 65 %	
Round Head Brass	dis 60 %	
Flat Head Bronze	dis 65 %	
Round Head Bronze	dis 60 %	

Machine—
Flat Head, Iron.....dis 55 %
Round Head, Iron.....dis 50 %

Bench and Hand—
Bench, Iron.....dis 55&10 @ 55&10&10 %
Bench, Wood, Beech.....₩ doz $2.25
Bench, Wood, Hickory.....dis 20&10 %
Hand, Wood.....dis 25&10 @ 25&10&5 %
Lag, Blunt Point.....dis 75 @ 75&10 %
Coach and Lag, Gimlet Point.....dis 75 %
Bed.....dis 25&5 %
Hand Rail, Sargent's.....dis 66⅔&10 %
Hand Rail, Humason, Beckley & Co.'s..dis 70&10@75 %
Hand Rail, Am. Screw Co.....dis 75 %
Jack Screws, Millers Falls list.....dis 50 @ 50&5 %
Jack Screws, P. S. & W.....dis 35 %
Jack Screws, Sargent.....dis 60&10 @ 60&10&5 %
Jack Screws, Stearns'.....dis 40 @ 40&10 %

Scroll Saws.
Lester, complete, $10.00.....dis 25 %
Rogers, complete, $4.00.....dis 25 %
Barnes' Builders' and Cabinet Makers', $15.....dis 25 %

Scythe Snaths......dis 50&2 %

Shears.
American (Cast) Iron.....dis 75&10 @ 75&10&5 %
Pruning.....See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....₩ dos $3.75
Tinners'.....dis 20&2 %
Seymour's, List, Dec., 1881.dis 60&10&10@60&10&10&5 %
Heinsch's, List, Dec., 1881.dis 60&10&10@60&10&10&5 %
Heinsch's Tailor's Shears.....dis 33⅓ %
First quality C. S. Trimmers.....dis 80@80&10 %
Second quality C. S. Trimmers.dis 80&10@80&10&10 %
Acme Cast Shears.....dis 10&10 %
Diamond Cast Shears.....dis 10 %
Clipper.....dis 10&10 %
Victor Cast Shears.....dis 75&10@75&10&5 %
Howe Bros. & Hulbert, Solid Forged Steel.....dis 40 %
Cleveland Machine Co., Solid Steel Forged.....dis 70 %
Clauss Shear Co., Japanned.....dis 70 %
Clauss Shear Co., Nickeled, same list.....dis 60 %

Sheaves.
Sliding Door—
M. W. & Co., list July, 1888.....dis 50&10 @ 60&5 %
R. & E., list Dec. 18, 1885.....dis 55&2 %
Corbin's list.....dis 60&10&2 %
Patent Roller.....dis 60&10&2 %
Patent Roller, Hatfield's.....dis 75 %
Russell's Anti-Friction, list Dec. 18, 1885..dis 60&2 %
Moore's Anti-Friction.....dis 60 %
Sliding Shutter—
R. & E. list Dec. 18, 1885.....dis 60&10&2 %
Sargent's list.....dis 60&10 %
Reading list.....dis 60&10&10 %

Ship Tools.
L. & J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %

Shoes, Horse, Mule, &c.
Horse—
Burden's, Perkins', Phœnix, at factory.....$4.00
Mule—Add $1 ₩ keg to above prices.
Ox, Wrought—
Ton lots.....₩ ₵ 9¢
1000 ℔ lots.....₩ ₵ 9½¢
500 ℔ lots.....₩ ₵ 10¢

Shot.—*Eastern prices, 2½ off. cash, 5 days.)*
Drop, ₩ bag, 25 ℔.....$1.45
Drop, ₩ bag, 5 ℔.....34
Buck and Chilled, ₩ 25-℔ bag.....$1.70
Buck and Chilled, ₩ 5-℔ bag.....39

Shovels and Spades.
Ames' Shovels, Spades, &c., list Nov. 1, 1885....dis 20 %
NOTE.—Jobbers frequently give 5 @ 7½ % extra on above.
Griffith's Black Iron.....dis 50&10 %
Griffith's C. S.....dis 60 @ 60&10 %
Griffith's Solid Cast Steel R. R. Goods.....dis 20 %
Old Colony (Sanford Fork & Tool Co).....dis 20 %
St. Louis Shovel Co.....dis 20 @ 20&7½ %
Hussey, Binns & Co.....dis 15 @ 25 %
Hubbard & Co.....dis 20@20&7½ %
Lehigh Mfg. Co.....dis 50&10 %
Payne Pettebone & Son, list January, 1886.....dis 30 %
Remington's (Lowman's Patent).....dis 30&10 @ 40 %
Rowland's, Black Iron.....dis 50&10 %
Rowland's Steel.....dis 60&5 @ 60&10 %

Shovels and Tongs.
Iron Head.....dis 60&10@60&10&5 %
Brass Head.....dis 60&10&10 %

Skeins, Thimble.
Western list.....dis 75&5 @ 75&10 %
Columbus Wrt. Steel, list Nov. 1, 1887.....dis 20 %
Coldbrookdale Iron Co.....dis 50&10 %
Utica P. S. T. Skeins.....dis 60 %
Utica Turned and Fitted.....dis 35 %

Sieves.
Buffalo Metallic, S. S. & Co., new list..dis 50&25&10 %
Barker Flour Sifters.....₩ doz $2.00
Smith's Adjustable Sifters.....₩ doz $2.25
Smith's Adjustable Milk Strainer.....₩ doz $2.00
Smith's Adjustable F. & C. Strainer.....₩ doz $1.75

Sieves, Wooden Rim—	Iron.	Plated.
Mesh 18, Nested, ₩ doz	70¢	90¢
Mesh 20, Nested, ₩ doz	85¢	$1.00
Mesh 24, Nested, ₩ doz	$1.00	1.10

Slates.—School, by case.....dis 50&10 %

Snaps, Harness, &c.
Anchor (T. & S. Mfg Co.).....dis 65 %
Fitch's (Bristol).....dis 50&10 %
Hotchkiss.....dis 10 %
Andrews.....dis 50 %
Sargent's Patent Guarded.....dis 70&10&10 %
German, new list.....dis 40&10 %
Covert.....dis 50&2 %
Covert, New Patent.....dis 50&5&2 %
Covert New R. E.....dis 60@2 %
Covered Spring.....dis 60&10&10 %

Soldering Irons.
Covert's Adjustable, list Jan. 1, 1886.....dis 35&2 %

Spoke Shaves.—Iron.....dis 45 %
Wood.....dis 30 %
Bailey's (Stanley R. & L. Co.).....dis 40&10 %
Stearns'.....dis 20&10 @ 30 %

Spoke Trimmers.
Bonney's.....₩ dos $10.00, dis 50 %
Stearns'.....dis 20&10 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 55&10 %
Douglass'.....₩ dos $9.00, dis 20 %

Spoons and Forks.
Tinned Iron—
Basting, Central Stamping Co.'s list.....dis 70&10 %
Solid Table and Tea, Central Stamping Company's list.....dis 70&10 %
Buffalo, S. S. & Co.....dis 33⅓&2 %
Silver-Plated—4 mos. or 5 % cash 30 days.
Meriden Brit. Co., Rogers.....dis 50 %
C. Rogers & Bros.....dis 50 %
Rogers & Bro.....50 %
Reed & Barton.....dis 50 %
Wm. Rogers Mfg. Co.....dis 50&10 @ 50&10&5 %
Simpson, Hall, Miller & Co.....dis 50&10 %
Holmes & Edwards Silver Co..dis 50&10 @ 50&10&5 %
H. & E. Silver Co. Mexican Silver.....dis 50&5 %
H. & E. Silver Co., Durham Silver.....dis 50&5 %
German Silver.....dis 50 @ 50&5 %
German Silver, Hall & Elton.....dis 50&5 %, cash
Nickel Silver.....dis 50&5@50&10&5 %, cash
Britannia.....dis 60 %
Boardman's Flat Ware.....dis 50&10 %
Boardman's Nickel Silver.....dis 50 %
Boardman's Brit'nia Spoons, case lots.....dis 60 %

Extra 10@10&5 % generally given. 6 mos.

Springs.
Elliptic, Concord, Platform and Half Scroll.....dis 60 @ 60&5 %
Cliff's Bolster Springs.....dis 25 %

Squares.
Steel and Iron.....dis 75 @ 80 %
Nickel-Plated.....
Try Square and T Bevels.....dis 60&10&10 @ 70 %
Disston's Try Square and T Bevels.....dis 45&10 %
Winterbottom's Try and Miter.....dis 30&10 %
Starrett's Micrometer Caliper Squares.....dis 25 %

Staples.
Fence Staples, Galvanized } Same price as Barb Wire.
Fence Staples, Plain } See Trade Report.

Steelyards......dis 40&10@50 %

Stocks and Dies.
Blacksmith's, Waterford Goods....dis 30&5 @ 30&10 %
Lightning Screw Plate.....dis 25 @ 30 %
Reece's New Screw Plates.....dis 33⅓ @ 33⅓&5 %

Stone.
Hindostan No. 1, 3¢; Axe, 5¾¢; Slips No. 1, 5¢.
Sand Stone.....₩ ₵, 2¢
Washita Stone, Extra.....₩ ₵, 7 1@ 22¢
Washita Stone, No. 1.....₩ ₵, 15 @ 16¢
Washita Stone, No. 2.....₩ ₵, 11 @ 12¢
Washita Slips, No. 1, Extra.....₩ ₵, 40 @ 42¢
Washita Slips, No. 1.....₩ ₵, 30 @ 32¢
Arkansas Stone, No. 1, 4 to 6 in.....₩ ₵, $1.35
Arkansas Stone, No. 1, 6 to 9 in.....₩ ₵, $1.75
Turkey Oil Stone.....4 to 8 in., ₩ ₵, 40¢
Turkey Slips.....₩ ₵, $1.00 @ $1.50
Lake Superior, Chase.....₩ ₵, 16¢
Lake Superior Slips, Chase.....₩ ₵, 31@32¢
Seneca Stone, Red Paper Brand, ₩ ₵.....18 @ 20¢
Seneca Stone, High Rounds, ₩ ₵.....20 @ 25¢
Seneca Stone, Small Whets, ₩ gro.....$24.00

Stove Polish.—Joseph Dixon's..₩ gro $6, dis 10 %
Gem.....₩ gro $4.50, dis 10 %
Gold Medal.....₩ gro $6.00, dis 25 %
"Mirror".....₩ gro $6.00, dis — %
Lustro.....₩ gro $4.75 net
Ruby.....₩ gro $3.75 net
Rising Sun, 5 gro. lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ₵ 8¢ net
Boynton's Noon Day, ₩ gro.....$5.00
Parlor Pride Stove Enamel.....₩ gross, $13
Yates' Liquid, 2 3 5 10 gal. cans
₩ gal., $0.90 .80 .70 .60

Yates Standard Paste Polish ,10-lb cans, per lb., 15 ¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K. Enamel.....₩ gro $19.00
Bonnell's Liquid Stove Polish.....₩ gro $9.00
Bonnell's Paste Stove Polish.....₩ gro $6.00

Tacks, Brads, &c.
List, Jan. 2, 1888.

American Iron Carpet Tacks.....dis 72½&10&2 %
Steel Carpet Tacks.....dis 72½&10&2 %
Swedes Iron Carpet Tacks.....dis 72½&10&2 %
American Iron Cut Tacks.....dis 70&10&2 %
Swedes Iron Tacks.....dis 67½&10&2 %
Swedes Iron Upholsterers' Tacks..dis 67½&10&2 %
Tinned Swedes Iron Tacks.....dis 67½&10&2 %
Tin'd Sw'des Iron Uphol'ers' Tacks.dis 67½&10&2 %
Gimp and Lace Tacks.....dis 67½&10&2 %
Tinned Gimp and Lace Tacks.....dis 67½&10&2 %
Swedes Iron Trimmers' Tacks....dis 67½&10&2 %
Swedes Iron Miners' Tacks.....dis 67½&10&2 %
Swedes Iron Bill Posters' or Railroad Tacks.....dis 67½&10&2 %
Swedes Steel Tacks, all kinds (Swedes Iron price list).....dis 72½&10&2 %
Copper Tacks.....dis 33⅓&10&2 %
Copper Finishing Trunk and Clout Nails.....dis 33⅓&10&2 %
Finishing Nails.....dis 60&10&2 %
Trunk and Clout Nails.....dis 60&10&2 %
Tinned Trunk and Clout Nails.....dis 60&10&2 %
Basket Nails.....dis 60&10&2 %
Common and Patent Brads.....dis 60&10&2 %
Hungarian Nails.....dis 60&10&2 %
Chair Nails.....dis 60&10&2 %
Zinc Glaizers' Points.....dis 40&10&2 %
Cigar Box Nails.....dis 45&10&2 %
Picture-Frame Points.....dis 45&10&2 %
Looking-Glass Tacks.....dis 45&10&2 %
Leathered Carpet Tacks.....dis 45&10&2 %
Brush Tacks.....dis 45&10&2 %
Shoe Finders'.....List Jan. 2, 1888. dis 10 @ 10&5 %
Lining and Saddle Nails, List Jan. 1, 1886:
Silvered.....dis 30&10&10 %
Japanned.....dis 20&10&10 %
Double-pointed Tacks.....85 %
Wire Carpet Nails.....dis 50&10 %
Wire Brads and Nails.....See Nails, Wire
Steel Wire Brads, R. & E. Mfg. Co.'s list.....dis 50&10 %

Tap Borers.—Common and Ric.....dis 20&10 %
Ives' Tap Borers.....dis 33⅓&5 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Clark's.....dis 33⅓ @ 35 %

Tapes, Measuring.—American.....dis 25&10 %
Spring.....dis 40 %
Chesterman's.....Regular list dis 25 @ 30 %

Thermometers.—Tin Case.....dis 80 @ 80&10 %

Thimble Skeins.—See Skeins.

Ties, Bale.—Steel Wire, Stan'rd list..dis 50&10&5 %

Tinners' Shears, &c.
Shears and Snips (P. S. & W.).....dis 20 @ 25 %
Punches—See Punches.
Snips, J. Mallinson & Co.....dis 33⅓ %

Tinware.
Stamped, Japanned & Pieced, list Jan. 20, 18.....dis 70&10 @ 70&10&5 %

Tire Benders, Upsetters, &c.
Stoddard's Lightning Tire Upsetters.....dis 15 %
Detroit Perfected Tire Bender.....dis 15 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 20&10 @ 30 %
Wood Bottom.....₩ dos $5.00 @ $5.25
All Iron.....₩ dos $4.25
Nashua Lock Co.'s.....₩ dos $18.00, dis 50 @ 55 %
Wilson's.....dis 55 %
Sargent's.....₩ dos $24, dis 55&10 %
Acme.....₩ dos $20.00, dis 40 %

Transom Lifters
Wollensak's Patent Iron Bronzed.....dis 50 %
Reiber's Bronzed Iron Rods list Jan. 1, 1887.dis 50&2 %
Reiber's Real Bronze or Nickel Plate, list Jan. 1, 1887.....dis 50&2 %
Excelsior.....dis 50&10&2 %
Shaw's.....dis 50&10
Payson's Universal.....dis 40 @ 40&10 %
Crown and Star.....dis 50 %

Traps.
Game—
Newhouse.....dis 30 @ 40&5 %
Oneida Pattern.....dis 70 @ 75&5 %
Game, Blake's Patent.....dis 40&10&5 %
Mouse and Rat—
Mouse, Wood Chopper.....₩ dos boxes 11@12¢
Mouse, Round Wire.....₩ dos $1.50, dis 10 %
Mouse, Cage, Wire.....₩ dos $2.50, dis 10 %
Mouse, Catch-'em-alive.....₩ dos $2.50, dis 15 %
Mouse, "Bonanza".....₩ gross $10 net
Mouse, Delusion.....₩ gross $18.00, dis 15 %
Rat, "Decoy".....₩ gross $10.00, dis 10 %
Ideal.....₩ gross $10
Cyclone.....₩ gross $5.25
Hotchkiss Metallic Mouse, 5-hole traps....₩ dos 90¢
In full cases.....₩ doz 75¢

Trowels.—Lothrop's Brick and Plastering..dis 35 %
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 25 @ 25&10 %
Peace's Plastering.....dis 25 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 @ 20 %
Brade's Brick.....dis 25 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 70 %

Triers.—Butter and Cheese.....dis 35 %

Trucks, Warehouse, &c.
B. & L. Block Co.'s list, 1882.....dis 40 %

Tubes, Boiler.—See Pipe

Twine.	BC.	B.
No. 9, Flax Twine, ¼ and ⅛ ℔ Balls	22¢	50¢
No. 12, " " ¼ and ⅛ "	21¢	29¢
No. 18, " " ¼ and ⅛ "	18¢	28¢
No. 24, " " ¼ and ⅛ "	18¢	28¢
No. 36, " " ¼ and ⅛ "	16¢	27¢
No. 264, Mattrass, ¼ and ⅛ "		48 @ 50¢
Chalk Line, Cotton, ¼ ℔ Balls		25¢
Mason Line, Linen, ¼ "		55¢
3-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine)		11½¢
3-Ply Hemp, 1 ℔ Balls		12 @ 13½¢
3-Ply Hemp, 1¼ ℔ Balls		11 @ 11½¢
Cotton Wrapping, 5 Balls to ℔		15¢ @ 16¢
2, 3, 4 and 5 Ply Jute, ¼ ℔ Balls		19¢
Wool		6½¢ @ 6¾¢
Paper		13¢ @ 14¢
Cotton Mops—6, 9, 12 and 15 ℔ to doz.		18¢

Vises.
Solid Box.....dis 60 @ 60&5 %
Parallel—
Fisher & Norris Double Screw.....dis 15&10 %
Stephens'.....dis 25 @ 30 %
Parker's.....dis 20 @ 25 %
Wilson's.....dis 55 %
Howard's.....dis 40 %
Bonney's.....dis 40&10 %
Millers Falls.....dis 40 @ 40&10 %
Trenton.....dis 40&5 40&10 %
Merrill's.....dis 15@20 %
Sargent's.....dis 60&10&10 %
Backus and Union.....dis 40 %
Double Screw Leg.....dis 15&10 %
Prentiss.....dis 20&5 @ 25 %
Simpson's Adjustable.....dis 40 %
Saw Filers—
Bonney's, Nos. 2 & 3.....₩ doz $15.00, dis 4 &10 %
Stearn's.....dis 33⅓&10 @ 33⅓&10&10 %
Stearn's Silent Saw Vises.....dis 33⅓ @ 35 %
Sargent's.....dis 66⅔&10 %
Hopkins'.....₩ doz $17.50 dis 10 %
Reading.....dis 40&10 %
Wentworth.....dis 20&10 %
Combination Hand Vise.....₩ gro, $42.00
Cowell Hand Vises.....dis 20 %
Bauer's Pipe Vises.....dis 10 %

Wagon Boxes.
Per lb.....2¼¢
Wagon Jacks.—Daisy.....₩ doz $4.00, dis 25 %

Washer Cutters.
Smith's Patent.....₩ doz $12.00, dis 40&10&10 %
Johnson's.....₩ doz $11.00, dis 33⅓ %
Penny's.....₩ doz Pol. $14; Jap'd, $16..dis 50 %
Appleton's.....₩ doz $16.00, dis 60&10 %
Bonney's.....dis 30&10 %

Washers.

Size	¼	5-16	⅜	½	⅝	¾	1
Washers	7	5¼	4½	3¾	2¼	3¼	3¼

In lots less than 200 ℔, ₩ ℔, add ½¢, 5-℔ boxes 1¢ to list.

Wedges.—Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 4 ¢

Well Buckets, Galvanized.
Hill's.....₩ doz., 12 qt., $4.25; 14 qt., $5.25
Iron Clad.....₩ doz., 14 qt., $4.25 @ $4.50
Whiting's Flat Iron Sand.....₩ doz $4.25 @ $4.50
Whiting's Wired Top.....₩ doz $4.00 @ $4.25

Well Wheels—8 in., $2.25; 10 in., $2.70; 12 in., $3.25.

Wire.
Iron—
Market, Br. & Ann., Nos. 0 to 18.....dis 70&10@75 %
Market, Coppered, Nos. 0 to 18.....dis 70@70&5 %
Market, Galvanized, Nos. 0 to 18.....dis 65&5 %
Market, Tin'd, Tinned list Nos. 0 to 18.....dis 67½ %
Stone Br. & Ann'd, Nos. 16 to 18....dis 72½@72½&5 %
Stone, Bright & Ann'd, Nos. 19 to 26.....dis 75@75&5 %
Stone, Br. & Ann'd, Nos. 27 to 36.....dis 70&10&5 %
Stone, Tin'd, Tin'd list, Nos. 18 to 36..dis 70@70&10 %
Tinned Broom Wire, Nos. 18 to 24..dis 70&5@70&10 %
Galvanized Fence.....dis 65 %
Annealed Fence, Nos. 8 & 9.....dis 75 %
Annealed Grape, Nos. 10 to 14.....dis 75 %
Brass, list, Jan. 18, '84.....dis 15 @ 20 %
Copper, list Jan. 18, 1884.....dis 20 @ 25 %
Baru Fence.....See Trade Report
Wire on Spools.....dis 65 %
Mallin's Steel and Tinned Wire on Spools.....dis 40 %
Mallin's Brass and Copper Wire on Spools.....dis 30 %
Cast Steel Wire.....dis 50 %
Stubs' Steel Wire.....$5.00 to 2, dis 30 %
Steel Music Wire, Nos. 12 to 30.....55¢ ₩ ℔
Picture Wire.....dis 60&10 %
Barb Wire Safety Guards.....₩ 1000 $9.00, dis 25 %
Wire Clothes Lines.—See Lines.

Wire Cloth, Netting, &c.
Painted Screen Cloth, No. 34, ₩ 100 sq. ft.....$1.90
Painted Screen Cloth, No. 33, ₩ 100 sq. ft.....$2.00
Galvanized Wire Netting.....dis 70&10 @ 75 %

Wire Goods.—See Brit'n Wire Goods.

Wire Rope.—List May 1, 1886.....dis 33⅓ %

Wrenches.—American Adjustable.....dis 45 %
Baxter's Adjustable "S".....dis 40&10 @ 50 %
Baxter's Diagonal.....dis 40&10 @ 50 %
Coes' Genuine.....dis 55&3
Coes' "Mechanics".....dis 55&10&3 %
Girard Standard.....dis 70&10
Machinists, Sterling Wrench Co.....dis 70&10 %
Lamson & Sessions' Engineers'.....dis 60&10 %
Lamson & Sessions' Standard.....dis 70&10 %
Coes' Pattern, Wrought.....
Girard Agricultural.....
Lamson & Sessions' Agricultural.....dis 80 @ 80&5 %
Sterling Wrought.....
Bemis & Call's Patent Combination.....dis 35 %
Bem's & Call's Merrick's Pattern.....dis 35 %
Bemis & Call's Brigg's Patten.....dis 25 %
Bemis & Call's Cylinder or Gas Pipe.....dis 40&5 %
Remis & Call's No. 3 Pipe.....dis 35&5 %
Aiken's Pocket (Bright).....$3.00, dis 50&10 %
The Favorite Pocket (Bright).....₩ doz $4.00, dis 40¢
Webster's Patent Combination.....dis 25 %
Boardman's.....dis 25 & 10 %
Always Ready.....dis 25&5
Alligator.....dis 50 %
Donohue's Engineer.....dis 10&10 %
Acme, Bright.....dis 60&3 %
Acme, Nickeled.....dis 50&3 %
Walker's.....dis 50&3 %
Diamond.....dis 40 %
Diamond Patent Steel.....dis 40 %

Wringers, Clothes.
List Jan. 10, 1888. $2.50 off.

Wrought Goods.
Staples Hooks, &c., 1s Jan. 12, '87.dis 80&20@50&25

CURRENT METAL PRICES.

OCTOBER 10, 1888.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:
¾ to 2 in. round and square.. } ₩ lb 1.90 @ 2.00¢
1 to 6 in. x ⅜ to 1 in..... }
Refined Iron:
¾ to 2 in. round and square.. }
1 to 4 in. x ⅜ to 1½ in..... } ₩ lb 2.10 @ 2.2¢
4½ to 6 in. x ⅜ to 1 in ..... }
1 to 6 in. x ¼ and 5-16 ..... ₩ lb 2.30 @ 2 4¢
Rods—⅝ and 11-16 round and sq..₩ lb 2.30 @ 2.3¢
Bands—1 to 6 x 3-16 to No. 12....₩ lb 2.30 @ 2.4¢
"Burden Best" Iron, base price..₩ lb 3.00 @ ....¢
Burden's "H. B. & S." Iron, base price..... ₩ lb 2 80 @ ....¢
"Ulster"..... lb 3.10 @ ....¢
Norway Rods ..... 4 00 @ 5.00¢

Merchant Steel from Store.

Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots..... 2¾¢ @ 3¢
Best Cast Steel, base price in small lots 8¾¢ @ 9¢
Best Cast Steel Machinery, base price in small lots ..... 5½¢ @ 6¢

For Classification and Extras adopted by the Merchant Steel Association of the United States, June 1, 1888, see *The Iron Age*, June 21, 1888.

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
10 to 16	₩ lb 2.75	@ 2.80¢	3.25 @	....¢
17 to 20	₩ lb 2.85	@ 3 00¢	3.25 @	3.50 ¢
21 to 24	₩ lb 3.00	@ 3.10¢	3.50 @	....¢
25 and 26	₩ lb 3 20	@	3.50 @	....¢
27	₩ lb 3.35	@ 3.37½¢	3.75 @	....¢
28	₩ lb 3.50	@ .. ..¢	4.00 @	....¢

	B. B.		2d qual.
Galv'd, 14 to 20,	₩ lb. 4.50	@	4 38 @ ....¢
Galv'd, 1 to 24,	₩ lb. 4.87½	@	4.75 @ ....¢
Galv'd, 25 to 26,	₩ lb. 5 25	@	5.12 @ ....¢
Galv'd, 27	₩ lb. 5.62½	@	5.48 @ ....¢
Galv'd 28	₩ lb. 6 00	@	5.85 @ ....¢
Patent Planished	₩ lb	A 10¢	B, 9¢
Russia	₩ lb	9½¢ @	10¢
American Cold Rolled B. B	₩ lb	5¢ @	7¢

English Steel from Store.

Best Cast	₩ lb	15 ¢
Extra Cast	₩ lb	16½ @ 17 ¢
Swaged, Cast	₩ lb	16 ¢
Best Double Shear	₩ lb	15 ¢
Blister, 1st quality	₩ lb	12½¢
German Steel, Best	₩ lb	10 ¢
2d quality	₩ lb	9 ¢
3d quality	₩ lb	8 ¢
Sheet Cast Steel, 1st quality	₩ lb	15 ¢
2d quality	₩ lb	14 ¢
3d quality	₩ lb	12½¢

METALS.

Tin.

	Per lb
Banca, Pigs	25¢
Straits, Pigs	25¢
English, Pigs	24½¢
Straits in Bars	26¢

Tin Plates.

Charcoal Plates—Bright.

		Per box.
Melyn Grade	IC 10 x 14	$6 00 @ $6.25
" "	IC, 12 x 18	6 25 @ 6.50
" "	IC, 14 x 20	6.00 @ 6.25
" "	IC, 20 x 28	12 50 @ 13.00
" "	IX, 10 x 14	7.50 @ 7.75
" "	IX, 12 x 12	7.75 @ 8.00
" "	IX, 14 x 20	7.50 @ 7.75
" "	IX, 20 x 28	15 50 @ 16.00
" "	DC, 12½ x 17	5 75 @ 6.00
" "	DX, 12½ x 17	7 25 @ 7.50
Call and Grade	IC, 10 x 14	6.00 @ 6 26
" "	IC, 12 x 12	6.25 @ 6.50
" "	IC, 14 x 20	6.00 @ 6.25
" "	IX, 10 x 14	7.50 @ 7.75
" "	IX, 12 x 12	7 75 @ 8 00
" "	IX 14 x 20	7.50 @ 7.75
Allaway Grade	IC, 10 x 14	$5.37½ @ ....
" "	IC, 12 x 12	5.50 @ ....
" "	IC, 14 x 20	5.37½ @ ....
" "	IC, 20 x 28	11.50 @ ....
" "	IX, 10 x 14	6.25 @ ....
" "	IX, 12 x 12	6 50 @ ....
" "	IX, 14 x 20	6.25 @ ....
" "	IX, 20 x 28	13.00 ....
" "	DC, 12½ x 17	.00 @ ....
" "	DX, 12½ x 17	6.00 @ ....

Coke Plates—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20		$5.00 @ ....
	10 x 20	7.50 @ 7.65
	20 x 28	10.25 @ ....
	IX, 10 x 14, 14 x 20	5.75
BV Grade.—IC, 10 x 14 14 x 20		4.70 @ ....

Charcoal Plates.—Terne

Ocean Grade.—IC, 14 x 20		$4.62½ @ ....
	20 x 28	9 25 @ ....
	IX, 14 x 20	5.62½ @ ....
	20 x 28	11.37½ @ ....
Abecarne Grade.—IC, 14 x 20		4.50 @ ....
	20 x 28	9.00 @ ....
	IX, 14 x 20	5.50 @ ....
	20 x 28	10.80

Tin Boiler Plates.

IXX, 14 x 26	112 sheets	$12 50 @ $12.75
IXX, 14 x 28	112 sheets	12 75 @
IXX, 14 x 31	112 sheets	14.25 @

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value, 45 % ad valorem.

Ingot.

Lake	@ 18¼¢
"Anchor" Brand	@ 18 ¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		25	25	25	26	27	28	31	33
30		72	25	25	25	26	28	30	34	...
36	96		25	25	25	27	29	33	36	....
36		96	25	25	26	28	30	34	38	....
48	96		25	25	27	29	31	35	....	....
48		96	25	25	28	30	32	36	....	....
60	96		25	25	30	32	37	....	....	....
60		96	25	26	31	....	....	....	....	....
84	96		26	27	..	....	....	....	....	....
84		96	27	28	....	....	....	....	....	....
Over 84 in. wide			28	30	....	....	....	....	....	....

	16 oz.	14 oz.	12 oz.	10 oz.
All Bath Tub Sheets				
Per pound	$0.28	0.30	0.32	0 35

Bolt Copper, ¾ inch diameter and over, per pound..... 25¢
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles over 60 inches diameter, up to 96 inches diameter inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Fits and Flats.

Per pound.
14 ounce to square foot and heavier..... 28¢
12 ounce and up to 14 ounce to square foot..... 29¢
10 ounce and up to 12 ounce..... 31¢
Circles less than 8 inches diameter 2 cents per pound additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each..... 8¢
Tinning sheets on one side, 30 x 60 each ..... 30¢
For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each..... 15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each ..... 12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each..... 12¢
Tinning sheets on one side, other sizes, per square foot..... 2½¢
For tinning both sides double the above prices.

Planished Copper.

Planished Copper List May 5, 1888 ..... Net

Brass and Copper Tubes.

Seamless Copper.		Seamless Brass.	
⅜ inch	₩ lb .50¢	⅜ inch	₩ lb .47¢
½ "	" " 44¢	½ "	" " 41¢
⅝ "	" " 42¢	⅝ "	" " 39¢
¾ "	" " 40¢	¾ "	" " 37¢
⅞ "	" " 39¢	⅞ "	" " 36¢
1 "	" " 37¢	1 "	" " 34¢
1⅛ "	" " 34¢	1⅛ "	" " 31¢

Roll and Sheet Brass.

Discount from list..... 10 @ 15 %

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.
Western Spelter..... 5½¢ @ 6¢
"Berg-nport"..... 8¾¢
"Bertha"..... 7¾ @ 8¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.
600 lb casks..... 6¾¢
Per lb ..... 7½¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.

American	5½ @ 6 ¢
Newark	5½ @ 6 ¢
Bar	6½¢
Pipe, subject to trade discount	7¼¢
Tin-Lined Pipe, subject to trade discount	15¢
Block Tin Pipes subject to trade discount	45¢
Sheet, subject to trade discount	8¢

Solder.

½ @ ½ (Guaranteed)..... 16¢
Extra Wiping..... 13½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson..... ₩ lb 13¾ @ 14¢
Hallett's ..... " 11¾¢

Plumbers' Brass Work.

	Discount per cent.
Ground Bibbs and Stops	55&10&2
Ground Stops, Hydrant Cocks, &c	55&10&2
Corporation Cocks	55&10&2
Corporation Cocks, "Mueller" Pattern, from Western list	55&10&2
Ground Basin and Shampooing Cocks	50&10&2
Compression Basin Cocks	50&10&2
Compression Basin and Sink Cocks	50&10&2
Compression Pantry Cocks	50&10&2
Coupression Double Basin and Shampooing Cocks	50&10&2
Compression Double Bath Cocks	50&10&2
Compression Bibbs, Urinal Cocks, Sill Cocks, Stops, Hopper Cocks, Hydrant Cocks and Ball Cocks	50&10&2
Basin Plugs and Basin Grates	55&10&2
Bath and Wash Tray Plugs	55&10&2
Bath Wastes and Washers, Bath and Basin Valves, Sewer and Vacuum Valves, Cistern Valves, Pump Valves and Strainers, Ship Closet Valves and Suction Baskets	55&10&2
Basin Clamps, Basin Joints and Strainers	55&10&2
Boiler Couplings, Ground Face, per set $1.25	dis 10
Boiler Couplings, Plain Face, per set $1.20	dis 10
Water Back Valve and Plain Couplings, Soldering Nipples and Unions	55&10&2
Union Joints	60&10&2
Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and Guides	55&10&2
Hose Goods	55&10&2

Steam and Gas Fitters' Brass and Iron Work.

	Discount per cent.
Brass Globe Valves	60&10&2
Finished Brass Globe Valves, with Finished Brass Wheels	40&10&2
Brass Globe Valves, with Patent Wood Wheels	60&10&2
Brass Globe Angle and Corner Valves	60&10&2
Brass Radiator Angle Valves	60&10&2
Brass Radiator Angle Valves, Frink's Patent	60&10&2
Brass Cross and Check Valves	60&10&2
Brass Check Valves	60&10&2
Brass Hose Valves	60&10&2
Brass and Iron Frink Valves	60&10&2
Brass Safety Valves	60&10&2
Brass Vacuum Valves	50&10&2
Brass Whistle Valves	60&10&2
Brass Balance, Back Pressure and Foot Valves	50&10&2
Brass Butterfly and Throttle Valves	50&10&2
Brass Pump Valves	50&10&2
Brass Steam Cocks	57½&10&2
Brass Service, Meter and Union Meter Cocks	57½&10&2
Brass Whistles, Water Gauges and Oil Cups	60&10&2
Brass Hollow Plug, Tallow and Globe Oil Cups	50&10&2
Brass Lubricators	60&10&2
Brass Air Valves	60&10&2
Brass Air Cocks	60&10&2
Brass Gauge Cocks	55&10&2
Brass Cylinder Cocks and Steam Bibbs	50&10&2
Brass Swing Joints and Expansion Joints	50&10&2
Brass Tea Pumps	50&10&2
Brass Steam Fittings, Rough	60&10&2
Brass Steam Fittings, Finished	2 &10&2
Brass Union Joints	60&10&2
Brass Soldering Unions and Nipples	55&10&2
Brass Hose Fittings, Fusible and Boiler Plugs	55&10&2
Iron Body Globe, Angle, Cross and Check Valves	65&10&2
Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves	65&10&2
Iron Cocks, all Iron	65&10&2
All Iron Valves	65&10&2

Miscellaneous.

	Discount per cent.
Cast Iron Fittings	70&10
Plugs and Bushings	75&10
Malleable Iron Unions	67½
Malleable Iron Fittings	35

Paints.

Black, Lamp—Coach Painters'	₩ lb 22 @ 24¢
" Ordinary	6¢
Black, Ivory Drop, fair	12 @ 15¢
" " best	23¢
Black Paint, in oil, kegs, 8¢; assorted cans	11¢
Blue, Prussian, fair to best	40 @ 55¢
" " " in oil	45 @ 55¢
" Chinese dry	70¢
" Ultramarine	18 @ 30¢
Brown, Spanish	1¼¢
" Van Dyke	10 @ 12¢
Dryers, Patent American	ass'd cans, 9¢; kegs 7¢
Green, Chrome in oil	15 @ 23¢
Green, Chrome in oil	14 @ 18 @ 25¢
Green, Paris	good, 20¢; best, 25¢
Green, Paris in oil	good, 30¢; best, 35¢
Iron and Bright Red	₩ lb 2½¢
Iron Paint, Brown	₩ lb 1½¢
Iron Paint, Purple	₩ lb 3¢
Iron Paint, Ground in oil, Bright Red	₩ lb 6½¢
Iron Paint, Ground in oil, Red	₩ lb 5½¢
Iron Paint, Ground in oil, Brown	₩ lb 5½¢
Iron Paint, Ground, Purple	₩ lb 6¢
Litharge	6½¢
Mineral Paints	2 @ 4¢
Orange Mineral	10¢
Red Lead, American	6½¢
Red Venetian (Eng.) dry	$1.65 @ $1.70
Red Venetian in oil	ass't'd cans, 11¢; kegs, 8¢
Red Indian Dry	9 @ 12
Rose Pink	10